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PUBLIC HEARING ON
WATER USES, STREAM STANDARDS AND IMPLEMENTATION PLANS
FOR ALL STREAMS WITHIN THE CLINCH RIVER BASIN

Clinton, Tennessee

January 19, 1971

Tennessee Stream Pollution Control Board
Department of Public Health
621 Cordell Hull Building
Nashville, Tennessee 37219

PUBLIC HEARING ON
WATER USES, STREAM STANDARDS AND IMPLEMENTATION PLANS
FOR ALL STREAMS WITHIN THE CLINCH RIVER BASIN

The material contained herein is a transcript of the testimony presented at the public hearing held in Clinton, Tennessee, on January 19, 1971, under the direction of the Tennessee Stream Pollution Control Board.

The purpose of the hearing was to discuss stream uses, specific standards of quality and the plan for implementation and enforcement of standards for all of the streams within the Clinch River drainage area.

The Legal Notice, which precedes the transcript, was mailed and posted in accordance with Tennessee Code Annotated Section 70-304.

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TENNESSEE STREAM POLLUTION CONTROL BOARD

Department of Public Health
Room 621 Cordell Hull Building
Nashville, Tennessee 37219

LEGAL NOTICE

NOTICE IS HEREBY GIVEN, pursuant to Tennessee Code Annotated, Section 70-304, that a public hearing will be held in accordance with the following schedule:

Time: 9:30 a.m. C.S.T.
Date: Tuesday, January 19, 1971
Place: Anderson County Court House, Circuit Court Room, Clinton,
Tennessee

for the purpose of establishing stream uses, establishing specific standards of water quality and discussing the plan for the implementation and enforcement of the water quality criteria adopted by the Board for the following streams flowing through or within the counties of Roane, Cumberland, Morgan, Anderson, Knox, Campbell, Union, Claiborne, Grainger, Hancock and Hawkins; these being specifically the Clinch River and its tributaries.

Streams of the Clinch River Drainage Basin

Clinch River	Poplar Creek
Emory River	Bushy Fork Creek
Clifty Creek	Beaver Creek
Crab Orchard Creek	Bullrun Creek
Crooked Fork Creek	Hinds Creek
Island Creek	Cove Creek
Obed River	Davis Creek
Clear Creek	Powell River
White Creek	Sycamore Creek
Otter Creek	Indian Creek
Fox Creek	Big War Creek

All other tributaries of the Clinch River, named and unnamed

Discussion concerning water quality criteria, stream uses, stream standards and the corrective steps necessary for pollution abatement will be held. All persons will be afforded full opportunity to present testimony before the hearing officer with regard to the specific topics under discussion. It is requested that any person desirous of offering lengthy comments and discussion be prepared at the public hearing to offer a written statement which may be incorporated in the record of the proceedings. Comments should be limited insofar as is possible to those concerning present water uses, desired future uses, existing waste discharges, existing pollution problems and corrective measures needed for pollution control.

ALL PERSONS INTERESTED IN WATERS OF THIS AREA AND THE ABOVE LISTED STREAMS ARE URGED TO ATTEND THIS MEETING.

Tennessee Stream Pollution Control Board
S. Leary Jones, Executive Secretary

PUBLIC HEARING ON
WATER USES, STREAM STANDARDS AND IMPLEMENTATION PLANS
FOR ALL STREAMS WITHIN THE CLINCH RIVER BASIN

January 19, 1971

Anderson County Courthouse
Clinton, Tennessee

Mr. S. Leary Jones: I must apologize for starting at 10:00. The reason we started at 10:00, there's been some discussion of what we meant by C.S.T. on the Legal Notice. We really meant that to be Clinton Standard Time but too many people interpreted it as Central Standard Time. Of course, it should be Eastern Standard Time and we forgot where the time line was.

We've got the material condensed pretty well today-or the staff has. Mr. Ken Bunting will give a physical description of this basin, then Robert Hunt will give a description of the waste discharges and then Ken Bunting will assist him on the domestic sewage part, the State and municipal systems. They will handle that part very rapidly, one right after the other. Ken Bunting will then get into what we know concerning stream uses and then we'll be open to discussion. We are trying to present to you the information we have on this basin. This part, I hope, is of value to you. We want from you the information we do not have. We know what we've got in our records, but we will probably miss a few systems. If there is one operating that is not on this list, they are operating illegally because they have not applied for a permit; they're operating contrary to the regulations of the Board and the law the way it is written. All discharges into surface streams or adjacent to surface streams must have applied for a permit.

Realistically, the pollution in Tennessee can be solved, except for one thing - finances. This is going to depend entirely on the public. There is considerable work going on now, but it will take considerable millions of dollars to correct the pollution problem. You can talk about Federal and State funds all you want to, but the funds come from the people. This is the other reason for these hearings, to bring this information to the people, because law or no law, pollution is not going to be corrected without money. There are no valves to cut off and stop pollution. It takes treatment and millions of dollars. It is also going to take considerable money for staff to keep up with it. We are operating one-third of a program of what should be operated on water pollution control in the State of Tennessee. This is not an alibi, this is just facts. We are visiting each source of pollution less than once per year. The other purpose of this hearing is to take this information to the Stream Pollution Control Board. They will adopt stream standards. These standards must be adopted on each basin in the State. This particular hearing will cover the Clinch River and all of its tributaries. We will limit the discussion strictly to the Clinch River Basin until we get that information, then we can discuss anything you want to. These standards must be adopted throughout the whole basin or there cannot be the increase in Federal grant funds. The Federal government has been making 33% grants for municipalities, these grants can go up to 55% now that the State is making grants, provided stream standards have been adopted.

Ken, if you will start the physical description, we'll get into the details. Ken Bunting on our staff.

Mr. Ken Bunting:

Physical Description

The Clinch River Basin is located in North Eastern Tennessee, and drains all or portions of the following counties: Roane, Cumberland, Morgan, Anderson, Knox, Campbell, Union, Claiborne, Grainger, Hancock, and Hawkins. The Clinch is tributary to the Tennessee River near Kingston, in Roane County, at Tennessee River mile 567.8. Its headwaters are in Southwestern Virginia. The river mileage at the Tennessee-Virginia State line is 202.1. The river drains a total of 4,413 square miles. The basin contains two major reservoirs, Melton Hill Lake and Norris Lake and a portion of Watts Bar Lake.

Mr. Robert A. Hunt:

Wastewater Discharges

Among other duties and authority of the Tennessee Stream Pollution Control Board, it is the duty of the Board and it has the authority to receive and examine applications, plans, specifications, and other data and to issue permits for the discharge of sewage, industrial wastes, and other wastes into or adjacent to the waters of the State, stipulating in each permit the conditions under which, and the time during which, such discharge may be permitted. This responsibility is carried out under the Tennessee Department of Public Health by the Division of Stream Pollution Control and the Division of Sanitary Engineering. The Division of Stream Pollution Control supervises industrial wastewater discharges and non-public or private sewage collection and treatment systems. The Division of Sanitary Engineering is responsible for the supervision of public and State-owned sewerage systems.

This morning, I would like to report to you the status of these operations which are under the supervision of the Tennessee Department of Public Health. This report will also cover operations of the Tennessee Valley Authority's Kingston and Bull Run steam generation plants and the Atomic Energy Commission Complex near Oak Ridge. The projects will be discussed in the order that they discharge into the streams, starting at the lower end of the basin and moving upstream.

U. S. Tennessee Valley Authority, Kingston Steam Plant, Kingston, Roane County, located near the Emory River confluence with the Clinch River, has nine condenser cooling water units with a combined maximum pumpage of 967,000 gallons per minute (1.4 billion gallons per day). Waters of the Clinch River are diverted into the Emory River Channel to the cooling water intakes for the steam plant at mile 1.8 of the Emory River. Water is used for production of steam, condenser cooling, and fly ash disposal. Major change in water quality is thermal increase. Domestic sewage is treated by means of a septic tank with effluent discharge into the fly ash lagoon. The heated wastewaters are discharged into the Clinch River at mile 2.6. Thermal pollution problems associated

with the discharge of heated cooling waters are not clearly defined, and TVA, in cooperation with other Federal and State agencies, is now involved in a major research project along these lines.

Problems involving visible floating solids occasionally lost into Emory River Embayment from the fly ash storage lagoons and acid seepage from the coal storage area have been reported.

Roane Hosiery, Incorporated, Harriman, Roane County, produces ladies' hosiery. Wastewaters originate from the dye house, compressor cooling, and steam condensate. Domestic and dye house waters are discharged into the municipal system. Cooling water and steam condensate is discharged into Bullard Branch Embayment of Emory River at approximate mile 0.4. Wastewater characteristics include elevated temperature and trace oils. Total evaluation of this waste discharge is presently incomplete. The staff recommends heated cooling water only be discharged to the surface drainage ditch.

Mead Corporation, located adjacent to the Emory River from mile 11.0 to 11.5 at Harriman, Roane County, is a sulfite paper mill manufacturing corrugated board. The industrial waste consists of spent sulfite liquor containing amounts of bark and wood fibers. The waste for the most part is untreated except for screening and is combined with the effluent from the Harriman Sewage Treatment Plant. The combined wastes are then pumped some five miles out of the Emory River drainage to the Tennessee River at mile 567. Problems have been associated with the occasional loss or by-passing of pipeline waste to the Emory River. The City of Harriman is now working on a Federal sponsored pilot plant to evaluate biological treatment of combined paper and domestic wastes. It is the staff's recommendation to prevent any discharges of the wastewaters to the Emory River. Based upon the results of the pilot plant study, proper treatment of the wastewaters will be recommended for discharge into the Tennessee River.

Atomic Energy Commission (AEC), Oak Ridge Operations, Oak Ridge, Anderson-Roane County, "Covers the full spectrum of nuclear energy effort from basic research in exotic elements to the production of weapons components, from improving plant strains to the development of new reactor concepts." The facilities of Stream Pollution Control's interest include: (1) The Gaseous Diffusion Plant (ORGDP), (2) Oak Ridge National Laboratory, (ORNL), (3) The Y-12 Plant (Y-12) and (4) The University of Tennessee-Atomic Energy Commission Agricultural Research Laboratory (UT-AEC).

(1) Oak Ridge Gaseous Diffusion Plant (ORGDP) lies in Roane County in the southwest corner of the area and located within the Clinch River-Poplar Creek watershed. Union Carbide Corporation, Nuclear Division, is operating contractor. Principal product is enriched uranium 235.

Water is used as a process coolant and the plant has a maximum capacity of 400 million gallons per day of recirculating cooling water (RCW). Present water use is estimated to be 110 million gallons per day. Following is a brief summary of the location and characteristics of ORGDP's water and wastewater facilities:

R.C.W. Lagoon for recirculating cooling make-up and water treatment blowdown located at Clinch River mile 11.4.

R.C.W. Industrial Water Supply Intake (92,300 gallons per minute) for recirculating cooling water, located at Clinch River mile 11.6.

Laboratory Drains, containing trace amounts of various and sundry chemicals discharge through a series of ponds located at Poplar Creek mile 1.2.

Primary Sewage Treatment Plant (1 million gallons per day capacity) Influent population equivalent (P.E.) 2,600. Final effluent is chlorinated and approximately 0.7 million gallons per day is discharged to Poplar Creek mile 1.3.

Limestone Neutralization Pit used for neutralization (pH adjustment) of acid waste. Discharge is to Poplar Creek at mile 2.5.

Limestone Neutralization Pit used for pH adjustment and disposal of acid waste. Discharge is to Poplar Creek at mile 2.7.

Holding pond used for equalization and dilution of approximately 0.2 million gallons per day of process waste and 0.5 million gallons per day cooling water. Discharge is to Poplar Creek at mile 4.5.

Power House Sewage Treatment Plant is designed for primary treatment and effluent chlorination of 300 P.E. and 150 gallons per minute. Present load consists of 26 P. E. and 25 gallons per minute. Discharge is to the Clinch River at mile 12.8.

Domestic Raw Water Supply Intake (1,600 gallons per minute) for filtration and production of potable water supply. Located at Clinch River mile 14.5.

(2) Oak Ridge National Laboratory (ORNL) located in Roane County about ten miles from the City of Oak Ridge is operated by Union Carbide for the Atomic Energy Commission. One of the world's largest nuclear research centers, the Laboratory research and development programs include reactor development and technology, physical research, life sciences, radioisotopes development, and nuclear education and training.

An estimated 2.6 million gallons per day of water is used at ORNL facilities for industrial and domestic purposes.

Facilities for treatment of domestic sewage at ORNL include a 200,000 gallons per day primary sewage treatment plant and a 75,000 gallons per day secondary plant. The Primary Sewage Treatment Plant has a design of 2,400 P.E. and is presently loaded at 3,500 P.E. An estimated 125,000 gallons per day of primary treated domestic waste is discharged following chlorination into White Oak Creek at mile 2.3. The 75,000 gallons per day Secondary Type Activated Sludge Sewage Treatment Plant for the High FLUX Isotope Reactor (HFIR) Complex was placed into operation in 1967 and has a design of 150 P.E. and provides effluent chlorination. Effluent is discharged into Melton Branch at mile 1.1.

Sources of process and/or industrial wastewaters containing long lived radionuclides originate from several principal and numerous minor sources. Treatment and disposal facilities include the tank farms, settling basins, the process wastewater treatment plant and equalization basin, evaporator, and underground disposal by hydraulic fracturing.

Only liquids of low radioactive content are released to White Oak Creek from the settling basins, laundry, or sewage treatment plant. Liquid waste of intermediate activity are held at tank farms for treatment in the evaporator and final underground disposal by hydraulic fracturing.

Problems have been reported concerning the formation of radioactive seeps from disposal pits which are located in the White Oak Lake drainage area. Surface waters from the drainage basin are continuously monitored by AEC for radioactivity levels.

Average discharge through the process wastewater treatment plant is reported at 11 million gallons per month. Point of discharge is into White Oak Creek at mile 2.6. The effluent is monitored for radionuclides.

An average of 4,000 gallons per day of laundry wastewater is presently discharged untreated to White Oak Creek at approximate mile 2.4.

The major source of wastewater being discharged to White Oak Creek and Melton Branch is from process cooling lines.

(3) The Y-12 Plant located near the center of the Oak Ridge area (Anderson County) is operated under contract by Union Carbide. Its program includes: 1. Production of atomic weapons and components, 2. Fabrication support for weapons design agencies, 3. Support for the Oak Ridge National Laboratory, and 4. Support and assistance to other government agencies.

Domestic sewage is discharged into the Oak Ridge municipal system for treatment at the Oak Ridge West Plant.

Process wastewater is discharged into the East Fork Poplar Creek drainage headwaters. An estimated 10 million gallons per day, which includes 0.7 million gallons per day cooling tower blowdown, 8.0 million gallons per day cooling water, and 1.3 million gallons per day from area springs and surface runoff is passed through oil recovery and flow equalization facilities at New Hope Pond. Telemeter monitoring facilities are located at the influent and effluent of New Hope Pond (East Fork Poplar Creek mile 14.7).

Seepage ponds (S-3 Ponds) located adjacent to the headwaters of Bear Creek are used for disposal of acid waste from Y-12. Seepage from the ponds has resulted in some problem with excessive nitrate levels in Bear Creek headwaters.

(4) Agricultural Research Laboratory (ARL) located at Scarboro near Oak Ridge in Anderson County is operated by the University of Tennessee under contract to the Atomic Energy Commission. A program of radiobiological research which involves work with laboratory and farm animals, and in applied radiobotany and plant breeding.

Present waste disposal consists of a 30,000 gallons per day Secondary Type Package Sewage Treatment Plant for treatment of combined domestic sewage and livestock waste. Point of discharge is to Scaraboro Creek at mile 1.3. Future plans are to separate the livestock waste from domestic waste and treat it by means of oxidation lagoons followed by spray irrigation.

Herron Packing Company located in Knox County operates a custom slaughterhouse. Wastewater characteristics are quite similar to domestic sewage. However, the total organic contents of these wastes are considerably higher than those of domestic sewage. Waste treatment is provided by primary solids removal, anerobic oxidation, and aerobic oxidation. An estimated 10,000 gallons per day of treated effluent is discharged into a dry tributary which is confluent to Conner Creek at mile 2.1. It is recommended that satisfactory operation of the wastewater treatment facilities be continued.

Broadacre Dairies, Incorporated, located near Powell in Knox County is engaged in the processing of raw milk. The products are Grade A pasteurized milk and milk products. The major sources of concentrated industrial waste originate from equipment washing operations. Waste treatment for process wastewaters consists of spray irrigation to adjacent land. Recommendations have been made concerning the control of untreated wastewater being released to a dry tributary which is confluent to Beaver Creek at mile 25.3. The staff recommends that wastewater, other than non-polluted cooling waters, be prevented from discharging into the surface drainage ditch. Maintain satisfactory operation of the spray irrigation system.

Avondale Farms Creamery, Incorporated, located near Halls-Crossroads, Knox County, is engaged in the processing of raw milk. The products are Grade A pasteurized milk and milk products. The major sources of concentrated industrial waste originates from equipment washing operations. Waste treatment for process wastewaters consists of spray irrigation to adjacent land. Condenser cooling water is discharged into a tributary drainage ditch which is confluent to Beaver Creek at mile 36.7. The staff's recommendation is to discharge only non-polluted cooling wastewaters into the surface drainage ditch. Maintain satisfactory operation of the spray irrigation system.

US-TVA Bull Run Steam Plant located southeast of Oak Ridge, Anderson County, has condenser cooling water with a maximum pump capacity of 574 million gallons per day. Its industrial water supply intake is located at Clinch River mile 47.9. The predominate wastewater characteristic is temperature increase. Other sources of wastewater include fly ash lagoon effluent and treated domestic sewage from a 30,000 gallons per day secondary sewage treatment. TVA facilities are located adjacent to the Clinch River from mile 46.5 to 48.8.

American Nuclear Corporation, Anderson County, has engaged in the manufacture of nuclear instrumentation and fabricates radioactive sources for various users. According to available information, this company has ceased to operate on a production basis. However, Braden Branch, from approximate mile 1.0 downstream, was found to be contaminated with radioactive waste due to losses from this operation. Available information indicates that this portion of the stream will not be safe for public use for an undetermined number of years.

Modine Manufacturing Company, Clinton, Anderson County, produces aluminum formed automobile air-conditioning condensers and assemblies. The company has a 700 gallon per minute industrial water supply intake located at Clinch River mile 64.2. (Additional water is purchased.) Process waters are used for fume hood controls, oven quench of materials and other miscellaneous processes. Wastewater characteristics include low pH, chlorides, and fluorides. Wastewater treatment consists of a 3-day retention pond for settling and flow equalization prior to discharge. An average 14.0 million gallons per day is discharged into the Clinch River at mile 64.3. It is recommended that satisfactory operation of the wastewater disposal facilities be continued.

Norris Creamery, Incorporated, located at Norris in Anderson County is engaged in the processing of raw milk. The products are Grade A pasteurized milk and milk products. The major sources of concentrated industrial waste originate from equipment washing operations. Waste treatment for process waters consists of spray irrigation to the land located adjacent to a tributary drainage ditch which is confluent with Buffalo Creek at mile 4.0. Satisfactory operation and maintenance of spray irrigation system should be continued.

The Carborundum Company, located near Jacksboro in Campbell County, is presently under construction. This operation will produce silicon carbide. Domestic sewage will be treated by means of a septic tank, sand filter systems and chlorination. The treated effluent will be discharged to the industrial wastewater holding pond. Industrial wastewater will consist essentially of scrubber water from air pollution control devices. Industrial wastewater treatment consists of a 30-day retention pond which has a capacity of approximately 1.25 million gallons per day. An estimated 40,000 gallons per day will be discharged from this pond into a tributary drainage ditch which is confluent to Cove Creek at mile 13.7. It is recommended that construction of approved wastewater disposal facilities be completed and placed into satisfactory operation for plant start-up.

White Silica Sand Company, located near Caryville in Campbell County operates a sand classifier, washer, and stockpile operation adjacent to the waters of Cove Creek. Wastewater characteristics include settleable solids, suspended solids, and turbidity. Waste treatment consists of primary solids removal, addition of coagulant aids, and discharge to retention ponds for additional settling. This company is under Tennessee Stream Pollution Control Board Special Order to maintain and operate the waste disposal facilities in a satisfactory manner. Discharge from the retention lagoons is to Cove Creek at mile 19.7. The staff recommends that careful operation of the wastewater treatment facilities be provided at all times.

Key Limestone Division, LaFollette, Campbell County, operates a limestone quarry and a manufactured sand plant. Process waters used for dust control and sand washing are taken from the quarry. Problems associated with the limestone quarry are primarily due to accumulated settleable solids resulting from the crushing operation. Characteristics of the wastewaters from the sand washer

include settleable solids and turbidity. Settling basins have been provided for removal of turbidity and settleable solids. Discharge is to Cuckle Creek at mile 2.3. It is recommended that settling basins be operated in a satisfactory manner.

Tennessee Asphalt Company, LaFollette, Campbell County, operates an asphalt plant adjacent to Key Limestone Divisions. The company has an industrial water supply intake at Cuckle Creek at mile 2.4. Process water is used for control of dust emissions. Wastewater characteristics include settleable solids and turbidity. Settling basins operated jointly by the company and Key Limestone are provided for removal of settleable solids and turbidity. Discharge is to Cuckle Creek at mile 2.3. The staff recommends that settling basins be operated in a satisfactory manner.

M & M Polishing and Plating Company, LaFollette, Campbell County, renovates and chrome plates automobile bumpers. Wastewater characteristics include hexavalent chromium, nickel, acid, and alkaline cleaners. Present treatment consists of a waste disposal seepage pit for intermittent disposal of spent chromic acid solution, chromic acid rinses and sulfuric acid. An average quantity of 3,000 gallons per day of rinse water containing trace amounts of nickel is discharged to a tributary of Cuckle Creek at mile 0.2.

A need for treatment of the dilute rinse waters has not been determined at this time. Should future studies indicate a stream pollution problem, proper treatment must be provided.

In addition to these known sources of industrial waste discharges, we are aware that certain sections of this area undoubtedly experience water quality damage due to coal mining operations. At the present time, we are not aware of any direct discharges from washing operations in this basin. Drainage problems related to both strip and deep mining operations are very difficult to control and our present program is not sufficiently staffed to allow proper attention to be given these problems. However, I would like to report that the Division of Strip Mining and Reclamation for the Tennessee Department of Conservation includes stream pollution control measures in their regulations and they have been responsible for much improvement in these drainage problems.

The Division of Stream Pollution Control also supervises the construction and operation of non-public or private sewerage systems. These are generally small systems of 50,000 gallons per day capacity or less and are designed to provide complete treatment and chlorination of the wastewaters. In the Clinch River Basin, there are 29 of these systems in operation, one project under construction and preliminary approval has been granted for construction of one additional system. A table listing these systems and their location, size, receiving stream and treatment status will be entered into the records of this hearing. For this presentation, I shall simply read from this chart.

CLINCH RIVER BASIN
PACKAGE SEWAGE TREATMENT PLANTS
January, 1971

<u>NAME</u>	<u>LOCATION</u>	<u>COUNTY</u>	<u>GAL./DAY</u>	<u>RECEIVING STREAM</u>	<u>TREATMENT STATUS</u>
Coalfield School	Coalfield	Morgan	15,000	Davis Branch	Satisfactory
Oakdale School	Oakdale	Morgan	15,000	Tributary, Emory River	Satisfactory
Southern Railway	Oakdale	Morgan	5,000	Emory River	Satisfactory
Morgan Apparel	Wartburg	Morgan	5,000	Tributary, Crooked Fork	Satisfactory
Central High School	Wartburg	Morgan	15,000	Tributary, Crooked Fork	Satisfactory
Central Elementary School	Wartburg	Morgan	14,000	Tributary, Crooked Fork	Satisfactory
Holiday Out	Crossville	Cumberland	12,000	Basses Creek	Satisfactory
Camp Out USA	Crossville	Cumberland	12,000	Tributary, Scantling Br.	Satisfactory
Holiday Inn	Crossville	Cumberland	20,000	Tributary, Obed River	Satisfactory
Clyde M. York 4-H Camp	Crossville	Cumberland	18,000	Tributary, Obed River	Satisfactory
Norwood School	Oliver Springs	Anderson	15,000	Tributary, Poplar Creek	Satisfactory
U.T. AEC Agricultural Experiment Station	Oak Ridge	Anderson	30,000	Scarboro Branch	Satisfactory
US-TVA Bull Run Steam Plant	Claxton	Anderson	30,000	Clinch River	Satisfactory
Claxton School	Claxton	Anderson	15,000	Blaze Branch	Satisfactory
Oak Ridge Mobile Home Park	Claxton	Anderson	6,000	Tributary, Blaze Branch	Needs Evaluation
Pine Meadows Mobile Home Park	Claxton	Anderson	?	Worthington Branch	Satisfactory

<u>NAME</u>	<u>LOCATION</u>	<u>COUNTY</u>	<u>GAL./DAY</u>	<u>RECEIVING STREAM</u>	<u>TREATMENT STATUS</u>
South Clinton School	Clinton	Anderson	15,000	Tributary, Yarnell Br.	Satisfactory
Blowing Springs School	Clinton	Anderson	7,500	Blowing Springs Br.	Satisfactory
Briceville School	Briceville	Anderson	9,000	Tributary, Coal Creek	Satisfactory
Oliver Springs School	Oliver Springs	Roane	18,000	Indian Creek	Temporary
Ball Camp School	Knoxville	Knox	10,000	Plumb Creek	Satisfactory
Karns High & Elem. School	Karns	Knox	20,000	Beaver Creek	Satisfactory
Gibbs School	Halls	Knox	45,000	Beaver Creek	Construction
Marathon Oil Company	Knoxville	Knox	1,500	Wilcox Branch	Proposed
Norris Comfort Station	Norris Dam	Campbell	3,000	Clinch River	Satisfactory
Holiday Inn	Caryville	Campbell	30,000	Tributary, Cove Creek	Satisfactory
Caryville School	Caryville	Campbell		Tributary, Cove Creek	Unsatisfactory
Ridgeview School	Jacksboro	Campbell			
Holiday Inn	Cumberland Gap	Claiborne	28,000	Gap Creek	Satisfactory
Lincoln Memorial University	Harrogate	Claiborne		Tributary, Unnamed	Satisfactory
Sharp's Chapel School	Sharps Chapel	Union	6,000	Tributary, Hunting Creek	Satisfactory
New Jersey Zinc Company	Treadway	Hancock		Flat Gap Creek	Satisfactory

Mr. Bunting:

State and Municipal Sewage Treatment Systems

The City of Kingston is served by a sewage treatment plant which provides primary treatment. It is designed for a population equivalent of 3,700 people. Treated effluent is discharged to Watts Bar Lake at Clinch River mile 0.8. The Division of Sanitary Engineering recommends that officials take action toward providing more adequate treatment facilities and further recommends that they follow the sampling program which has been requested by the Division.

The City of Harriman has a sewage treatment plant which discharges to the Tennessee River, however, they have a periodic by-pass to the Emory River at mile 10.7; the Emory River enters the Clinch River at mile 4.4. The staff of Sanitary Engineering recommends that city officials take the necessary action toward providing secondary treatment of sewage.

The City of Wartburg has a tertiary sewage treatment system proposed which will treat 0.2 million gallons per day. Treated waste will be discharged at approximately mile 6.3 on Crooked Fork; Crooked Fork enters Emory River at mile 23.8. The Division of Sanitary Engineering has only received an engineering report on this plant. It may be several years before it is built.

Brushy Mountain State Prison is served by a secondary type sewage treatment plant with a design population equivalent of 1,400. Effluent is discharged to Stockstill Creek at mile 0.4; this creek is tributary to Crooked Creek at mile 18.7 and Crooked Creek enters the Emory River at mile 23.8. The staff recommends the continued improvement of the operation of the treatment facilities.

The City of Crossville is served by a secondary treatment plant designed for a population equivalent of 12,000. Treated waste is discharged to the Obed River at mile 38.6; the Obed empties into the Emory River at mile 28.4. The Division of Sanitary Engineering recommends that officials proceed immediately to get plant construction completed and to improve the operation of the treatment facilities. (Now completed.)

Oak Ridge West Sewage treatment plant located in Oak Ridge has a design population equivalent of 30,000. The plant provides primary treatment. Discharge is to East Fork Poplar Creek at mile 8.3. This stream enters Poplar Creek at mile 5.5 and Poplar Creek is tributary to the Clinch River at mile 12.0. The staff recommends action toward correcting infiltration and toward providing adequate treatment.

The City of Oliver Springs maintains a secondary type sewage treatment plant designed to treat the domestic waste of 7,500 persons. Treated effluent is discharged to Poplar Creek at mile 14.4; Poplar Creek enters the Clinch at mile 12.0. The Sanitary Engineering staff recommends that adequate operation of the treatment facilities be provided and that construction of the collection system be continued.

W. A. Reynolds Subdivision in Knox County has proposed a 0.1 million gallon per day tertiary type sewage treatment plant to serve the subdivision. Treated effluent would be discharged to Hickory Creek at mile 3.8; Hickory Creek enters the Clinch River at mile 28.2. It was recently learned by the Division of Stream Pollution Control that plans for building this facility have been abandoned.

Karns Industrial Park in Knox County has proposed a 0.1 million gallon per day sewage treatment plant. It would provide secondary treatment. Treated waste would be discharged to Beaver Creek at mile 10.4. Beaver Creek is confluent with the Clinch River at mile 39.6. The plant is presently under construction.

Hallsdale Powell Utility District operates three sewage treatment plants in Knox County. All three provide secondary treatment. We will describe them by reference to Nos. 1, 2, and 3. There is also a No. 4 proposed.

STP #1 has a design population equivalent of 4,000. Discharge is to Beaver Creek at mile 31.4. The staff recommends the continued elimination of infiltration and that operation of the treatment facilities be improved.

STP #2 has a design population equivalent of 4,000. Discharge is to Beaver Creek at mile 23.6. The staff recommends that adequate solids handling facilities be provided and that more control be placed on industrial wastes entering the system.

STP #3 has a design population equivalent of 2,780. Discharge is to Beaver Creek at mile 39.8. Treatment at this plant is considered adequate; we recommend the continuation of present operational procedures.

Hallsdale Powell #4 is a proposed tertiary system to be designed for 3,000 people. Treated effluent will be discharged to Beaver Creek at mile 39.8; Beaver Creek is tributary to the Clinch River at mile 39.6. There has not been any construction on the plant and we do not know if it is still planned.

The City of Maynardville in Union County has a proposed tertiary sewage treatment system which will be designed for a population equivalent to 1,500 people. Treated waste would be discharged to North Fork Bull Run Creek at mile 3.1; this stream enters Bull Run Creek at mile 31.0 and Bull Run Creek is tributary to the Clinch River at mile 46.7. No construction has been started on this facility.

The Oak Ridge East Sewage treatment plant serving the City of Oak Ridge provides secondary treatment for a design population equivalent of 15,000 persons. Treated waste is discharged to an unnamed tributary 0.5 miles above its confluence with the Clinch River at mile 51.1. The Sanitary Engineering staff recommends improved operation and elimination of periodic by-passing.

The City of Clinton is served by three sewage treatment plants which will be described by the designations Nos. 1, 2, and 3.

STP #1 has a design population equivalent to 8,140 people. It provides secondary treatment before discharging wastes to the Clinch River at mile 56.9. The staff recommends this plant be placed into complete and efficient operation.

STP #2 has a design population equivalent of 180 and provides secondary treatment. Treated waste is discharged to the Clinch River at mile 64.1. The staff of Sanitary Engineering recommends continued careful operation of the treatment facilities.

STP #3 has a hydraulic design of 18,000 gallons per day and provides secondary treatment. Effluent is discharged to the Clinch River at mile 61.4. The Sanitary Engineering staff recommends the continued careful operation of the treatment facilities.

The City of Norris in Anderson County maintains a sewage treatment plant designed to serve 2,000 people and provide secondary treatment. Effluent is discharged to Buffalo Creek at mile 3.6; Buffalo Creek enters Hinds Creek at mile 5.5 and Hinds Creek is tributary to the Clinch River at mile 65.8. Treatment is considered adequate and the Division recommends continued careful operation.

Lake City has a secondary type sewage treatment plant designed to treat the domestic waste of 4,000 people. Treated waste is discharged to Coal Creek at mile 3.3; Coal Creek enters the Clinch River at mile 75.0. The staff recommends the continued improvement of operations.

Norris Dam State Park has proposed the installation of a tertiary type sewage treatment plant with a hydraulic capacity of 0.1 million gallons per day. Discharge would be to Cove Creek at mile 0.6; Cove Creek is tributary to the Clinch River at mile 80.1. The engineering report on this plant is two years old. No information is available regarding present plans.

Campbell County Wastewater System located at Jacksboro is constructing a plant designed to treat the waste from 4,000 people. Discharge will be to Cove Creek at mile 16.8.

The City of LaFollette is served by a secondary sewage treatment plant designed to treat the waste of 9,700 people. Effluent is discharged to Big Creek Embayment at mile 17.6; Big Creek is tributary to the Clinch River at mile 83.0. It is recommended that the sampling program which has been requested by the Division of Sanitary Engineering be followed as directed.

The City of Cumberland Gap in Claiborne County discharges untreated sewage to Gap Creek at mile (?). The staff recommends that city officials take immediate action toward providing adequate treatment facilities.

The Claiborne County Utility District at Tazewell in Claiborne County maintains a secondary sewage treatment plant to serve 3,300 people. Discharge is to Russell Creek at mile 6.0; Russell Creek enters the Powell River at mile 82.4 and this river is tributary to the Clinch at mile 88.8. The staff recommends that officials of the district take the following action: (1) Adopt a sewer use ordinance, (2) Require pre-treatment of industrial wastes, and (3) Control infiltration.

Big Ridge State Park in Union County has two tertiary treatment systems which will be described as Nos. 1 and 2.

System #1 has a capacity to treat 4,000 gallons per day and discharges to an unnamed tributary of Byrams Creek at mile 0.2; it enters Byrams Creek at mile 2.3; this stream is tributary to Mill Creek at mile 0.7 and enters Clinch River at mile 98.0.

The staff recommends that Park officials in charge place chlorinating facilities into operation and submit operation reports as requested.

System #2 also has a hydraulic capacity of 4,000 gallons per day and discharges into a dry ditch 0.2 miles from Poor Land Creek at mile 2.5; this creek is tributary to the Clinch River at mile 104.2. The staff recommends that operation reports be submitted for this plant also.

The City of Sneedville in Hancock County has a primary sewage treatment system with a design population equivalent of 1,400. Discharge is to the Clinch River at mile 177.4. The staff recommends continuation of improved operation, also, it may be necessary to provide additional treatment in the near future.

Mr. Hunt: The reports made to you on wastewater discharges this morning are, to us, very encouraging. In this day and time, the outcries of pollution doom often overshadow any recognition of positive action being taken on control.

In 1944, a study group published a report on stream pollution in Tennessee. The findings of this report was a basis for our Tennessee Stream Pollution Control Law which was passed in 1945. The report showed the total population with the Clinch River drainage basin to be 138,829 people, of which approximately 10% were urban and 90% rural. Since that time, the basin has undergone considerable change. The City of Oak Ridge and the Atomic Energy Commission facilities were born; Melton Hill Reservoir was impounded and the cool waters of the Clinch River influenced the construction of TVA's Kingston and Bull Run Steam Plants, used for the generation of electrical power to serve the valley.

In fact the waters of the basin have been a major factor in the growth and transition of the area. In 1944, there were only four domestic water systems using surface streams as a source of raw water. These four systems served a total population of less than 10,000 people. Today, there are 20 of these systems serving nearly 100,000 people. Clean water has been a contributing factor to the development of this resource.

My calculations show the population of the basin has now grown to 146,611 people; an increase of approximately 20% over the last 25 years. Not only has the area experienced this increase in population, but my figures show that the per cent urban population has changed from approximately 10% to nearly 35%. Often times, it is this change in concentration of people rather than the increase in total population which magnifies our environmental problems.

In 1944, there were ten public sewerage systems serving a total connected population of approximately 12,450 people. Of these systems, six had no treatment, three had primary treatment and only two had full, or secondary, treatment. Presently, there are 17 public sewerage systems serving an estimated population

of 90,000. Of these systems, only one has no treatment. This system is small and hopefully will be corrected soon. There is one other system existing in Jacksboro which presently has no treatment. However, a secondary treatment plant and extension of sewers are under construction. Of the other public systems, four are primary and 12 are secondary. We are working with all primary plants to improve their treatment capabilities to secondary.

Today, the discharged organic loads to the waters of the basin is estimated to be approximately 20,000 population equivalent as compared to a load of approximately 11,000 population equivalent in 1944. This represents tremendous progress when considering the population served by public sewers has increased from 12,450 to over 90,000.

Besides the Atomic Energy Commission complex and the TVA steam plants, we have reported today on 12 industrial wastewater discharges. Only one of these has inadequate facilities for controlling their effluent quality. Mead Corporation has a highly colored and organic wastewater from their pulping operations. Hopefully, present pilot plant studies will show a means of proper waste treatment. However, as mentioned before, these wastewaters are not discharged into the Clinch River basin but are pumped to the Tennessee River. Therefore, we have no significant organic load being discharged into the waters of the Clinch River drainage basin from industrial operations. Hopefully, the growth of the basin can continue in a manner that will not impair the high quality of the area surface and ground waters.

Mr. Bunting:

Stream Uses:

The following portion of this presentation on water quality criteria is directed toward a discussion of the present uses of the streams and the staff's suggested water uses.

A document entitled "General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee as Amended", should be in your possession. You may refer to this since it gives numerical values and states the permissible conditions in applying the water quality objectives in order to insure reasonable and necessary uses of the waters of the State. According to the criteria of water condition which has been adopted by the Tennessee Stream Pollution Control Board, there are seven major water uses which are to be considered for each section of the interstate and intrastate streams of Tennessee. These uses are:

1. Domestic Raw Water Supply
2. Industrial Water Supply
3. Fish and Aquatic Life
4. Recreation
5. Irrigation
6. Livestock Watering and Wildlife
7. Navigation

Based on available information, the staff of the Tennessee Stream Pollution Control Board has developed a proposal for the uses they feel should be considered

separately with a brief statement concerning present conditions in the stream. Also, you should have a chart entitled "Proposed Stream Use Classification". This chart summarizes the staff's suggested classifications for all the streams in this river basin. To further clarify, the Classification refers to the seven major water uses; the water quality necessary for each use is defined in the document, "General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee as Amended". In most instances, several uses are being proposed for the same section of stream, when this is the case, the strictest standards will apply.

The stream use classification which is adopted by the Board in combination with this "General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee as Amended" will constitute the Stream Standards. These will be filed with the Secretary of State and will be enforceable under the Tennessee Stream Pollution Control Law as amended in the "Clean Water Act of 1970".

The first use is:

Domestic Raw Water Supply

The Cumberland Utility District located in Roane County obtains a raw water supply from the Little Emory River at approximately mile 3.9. The facility serves 710 connections and has a capacity of 175 gallons per minute.

The City of Harriman in Roane County obtains water from the Emory River at approximately mile 14.8. This system serves 2,907 connections and has a pumping capacity of 2,084 gallons per minute. They also furnish water to the Swan Pond Utility District and the Wolfe Branch Utility District.

The Hallsdale Powell Utility District in Knox County gets a portion of its water supply from Beaver Creek at approximately mile 31.9. This system has a pumping capacity of 347 gallons per minute. They have another system capable of pumping 1,400 gallons per minute from Bull Run Creek Embayment of Melton Hill Reservoir at mile 3.5. The utility district's remaining water supply comes from ground water sources.

The City of Oak Ridge in Anderson County obtains a water supply from the Clinch River at approximately mile 41.5. The city serves 7,917 connections and has a pumping capacity of 11,368 gallons per minute.

The City of Clinton draws its water supply from the Clinch River at approximately mile 66.2. The system serves 1,550 connections and has a capacity of 789 gallons per minute.

The North Anderson County Utility District obtains a portion of the water supply from the Clinch River at mile 75.2. This portion of the system has a pumping capacity of 200 gallons per minute. The remainder of the district's supply is from a ground water source.

The City of Jacksboro in Campbell County obtains its water supply from the Cove Lake Embayment on Norris Lake. This is at approximately mile 16.3 on Cove Creek. The facility serves 620 connections and has a pumping capacity of 240 gallons per minute.

The City of Lafollette in Campbell County draws its water supply from Ollis Creek at mile 0.2. The system serves 2,300 connections and has a pumping capacity of 700 gallons per minute.

Arthur-Shawnee Utility District in Claiborne County obtains its water supply from the Powell River at approximately mile 65.2. They have a pumping capacity of 300 gallons per minute.

The staff recommends that the following sections of stream in the Clinch River basin be designated for domestic raw water supply use: Clinch River from mouth to Tennessee - Virginia State line; Emory River from mouth to headwaters; Little Emory River from mouth to headwaters; Obed River mile 40.1 to headwaters; Beaver Creek from mouth to mile 8.4, mile 10.4 to 17.5, mile 17.9 to mile 21.6, mile 23.6 to mile 29.4, mile 31.4 to headwaters; Cove Creek from mouth to mile 15.1, mile 16.1 to headwaters; Big Creek mouth to mile 15.6; Ollis Creek from mouth to headwaters; Powell River mouth to Tennessee - Virginia State line; North Fork Clinch River from mouth to Tennessee - Virginia State line.

Industrial Water Supply

Little information is presently available concerning industrial users obtaining water from surface streams in the area under discussion, although we are aware that several exist. The State of Tennessee's Division of Water Resources is presently compiling and updating this information. We recommend that the following stream sections be designated for this use: Clinch River from mouth to Tennessee - Virginia State line; Emory River from mouth to headwaters; Little Emory River from mouth to headwaters; Obed River mile 40.1 to headwaters; Beaver Creek from mouth to mile 21.6, mile 23.6 to 29.4, mile 31.4 to headwaters; Cove Creek from mouth to headwaters; Big Creek from mouth to mile 17.6; Ollis Creek from mouth to headwaters; Powell River from mouth to Tennessee - Virginia State line; North Fork Clinch River from mouth to Tennessee - Virginia State line.

Fish and Aquatic Life

The Clinch River is 175 miles in length in Tennessee and the basin includes Norris and Melton Hill Reservoirs and a portion of Watts Bar Reservoir. These impoundments provide good fishing for such species as: crappie, bluegill, smallmouth bass, largemouth bass and walleye. Clinch River, between Norris and Melton Hill Reservoirs, supports an excellent trout fishery. The Clinch River, above Norris Reservoir, provides good fishing for rock bass, smallmouth bass, longear sunfish, suckers and catfish. With the exception of several streams affected by coal mine pollution, the tributaries to the Clinch River are generally high quality streams, supporting such species as rock bass, smallmouth bass and trout.

The staff recommends all streams in the Clinch River basin be classified for Fish and Aquatic Life except a dry tributary of Poor Land Creek which receives a wastewater discharge.

Recreation

Recreation is an important use of the Clinch River and its tributaries. People visiting the lakes and streams engage in such recreational activities as sight-seeing, fishing, picnicing, boating, swimming and canoeing. There are many recreational facilities on Norris and Melton Hill Lakes. The staff recommends that all streams within the river basin be classified for recreation except those sections near certain sewage treatment outfalls which may not be suitable for body contact recreation. (See chart, Proposed Stream Use Classifications, in appendix.)

Irrigation

There is no current information concerning the number and location of irrigation systems on the Clinch River. It is an important use in farming areas and we recommend that all streams within the Clinch River basin be classified for this use except White Oak Creek; Melton Branch; Braden Branch, from mouth to mile 1.7, and a dry tributary of Poor Land Creek at mile 2.5.

Livestock Watering and Wildlife

Most of the land bordering on the Clinch River and its tributaries is farm land and forest. Wildlife are important users throughout the area. The staff proposes that the entire Clinch River basin be protected for this use.

Navigation

The last use classification to be considered is navigation. This use refers to commercial barge traffic and large boats of this type. Recreational boating is not included here but rather is included under recreation.

The staff proposes that the Clinch River be classified for navigation from its mouth to mile 61.5.

Mr. Jones: This will cover our formal presentation; we'll call on the ones now that indicated on their cards that they wish to testify and make comments, ask questions, etc. We'll go down through that group and if you failed to mark your card, you can change your mind. We'll call on those that marked first. If you did not fill out one of these cards, don't expect to get a transcript mailed to you because we won't have your name and address if it is not on a card. If, for some reason, you want more than one copy of the transcript, we'll send you all you want within reason, but don't tell me, write me. We'd like to know the number before we start printing. If you get home and think of something you wish you had said, write us, we'll be glad to have any comments from you go in the transcript

Mr. Dan Sherry, the Pollution Biologist with Tennessee Game and Fish Commission, is here and Dan has indicated that he wishes to testify. If you want to know where to go fishing, he will tell you.

Mr. Dan Sherry: Thank you, Mr. Jones. I have laryngitis today so I'll get real close to the mike and speak softly. First, I would like to introduce the Game and Fish people we have here in the room. Bob Land, our county officer. District Biologist, Bill Seawell. District 1 Biologist, Reed Tatum. I would also like to refer you to our complete statement that has been laying on the table; I think most of you picked it up. This will cover everything in detail which I'm going to say right now, and I will just bring out some of the high points.

The stream fishery of the watershed is primarily smallmouth bass, largemouth bass, rock bass, sunfish and suckers. The Indian River has one of the few remaining natural muskie fisheries in the State. We consider it valuable in that respect. The watershed also has 34½ miles of trout streams, six different trout streams; also there are several other streams that have not been developed for trout but which have the potential. Most of these 34½ miles are put and take and not natural trout streams. I think one is a natural trout stream. Also, some of these streams in the Clinch watershed are extremely valuable as float streams and used particularly for this. I am thinking of such streams as the Obed River, Clear Fork and the Upper Powell River. In the lake fishery, which has been mentioned before, Norris Reservoir, Melton Hill Lake and the upper end of Watts Bar, all warm water and cool water fishes are found in these lakes in variable portions from one lake to another. Norris Reservoir is one of the lakes of the State which has a very prolific natural wildlife production and we consider that very valuable. Artificial fisheries which have been developed in these three lakes are a limited two story trout fishery in Norris Lake, rock fish introductions, rock fish hybrid, and muskellunge.

We consider that the watershed in general has a very good quality of water with, of course, some exceptions and I will point out what we consider the major pollution sources. First of all, in municipal pollution, probably the biggest problem in the past has been Crossville Sewage Treatment Plant. I'm not too sure, but I think the new treatment plant should be completed at Crossville by now. However, as late as two weeks ago, we had complaints on some by-passing at Crossville in the Little Obed River. Also, at Crossville there is a vegetable processing plant upstream from the sewage treatment plant which in the warmer months discharges waste from vegetable processing with a particularly low pH. The Oak Ridge Sewage Treatment Plant severely pollutes the East Fork of Poplar Creek and also industrial effluent from Atomic Energy Commission discharges metals into East Fork of Poplar Creek. By far, the worst pollution in the watershed is the acid mine drainage which has effected over 135 miles of stream in the watershed. Of course, a lot of this happened back over the years and it takes many, many years, possibly hundreds of years, for the old wounds to heal themselves - so there is not a whole lot we can do about it. With the new power shortage that has been brought up here in the last year, I think the strip mining industry should be particularly careful to try to protect the remaining streams from further degradation. We would oppose all strip mining on certain streams. We would also like to bring particular attention to this area right here in Clinton and above on the Clinch River because, as many of you know, Game and Fish is proposing a new rock fish and muskie hatchery here at Clinton. We would not like to see any industrial or municipal discharge on the Clinch River above this point

which might degrade the quality of the water, because the quality of the water, of course, would be extremely crucial above this hatchery. In closing, I think I'll just read the final paragraph of our summary of conclusions in the statement here.

"Clean streams compliment Tennessee's numerous large reservoirs in providing a balanced recreational resource. A clean stream's natural qualities cannot be duplicated. As an increasing number of our streams succumb to impoundment and channelization, those that remain are to be even more cherished. We, therefore, recommend that all streams under consideration be classified in accordance with the requirements of fish and aquatic life."

Thank you.

Mr. Jones: Thank you, Mr. Sherry. Mr. Harvey Banks, Chairman of the Environmental Action Council of Oak Ridge, is here and has indicated that he would like to make comment. Harvey Banks.

Mr. Harvey Banks: Traditionally, the Environmental Council of Oak Ridge has been concerned with problems innate to the city and what effect it but there have been many types of proposals for industrial development in the area and other proposals for many types of so called improvements. If we are going to attract people to the area, we have to offer some type of incentive for them to come. I would like to address several questions which deal with water quality to the Board. First is, what does, "Maintained in a satisfactory manner" mean?

Mr. Jones: It means they'll meet the stream standards and the effluent standards that are set on the permit. These are the stream standards that you have read here.

Mr. Banks: What is the penalty for not following certain specifications?

Mr. Jones: The penalty, if the court will agree with us, will be from \$50 to \$500 a day fine and/or injunction, which means shutdown.

Mr. Banks: Is the penalty of \$50 to \$500 economically a deterrent?

Mr. Jones: The injunction is very economically deterrent. The reason for the \$50 under the State court system, as I understand it, if the fine is above \$50, you cannot go into General Sessions Court, you must go into Criminal Court to the Grand Jury. In Davidson County alone, there is a backlog of 900 cases for the Grand Jury. This worries us quite a bit. We're more interested in getting the pollution corrected than collecting fees for the State, this is the whole purpose of the Board. The \$500 a day, I think, is enough. The injunction procedure, I think is quite adequate. This will stop the pollution. Many people are "hollering", we ought to fine them \$5,000 - not when it takes a year to get a case through court. What difference does it make whether it's \$100 or \$5,000 - we've got to get a quicker procedure and the last legislature provided this quicker procedure, in that, when there is a violation of stream standards,

the Board can go into either General Sessions, Criminal or Chancery Court through the local district attorney. We have had wonderful cooperation from the district attorneys. These cases are usually settled out of court in less than ten days.

Mr. Banks: You mentioned the permit shows the conditions and time for certain amounts of discharge to be allowed. How are these conditions determined? Does the plant say we have been discharging this in the past and should be allowed to continue in the same way?

Mr. Jones: No, you weren't listening. The stream standards that are set say there must be certain bacterial limits, dissolved oxygen limits, solids, etc., that is transferred back to an effluent. We set that. It makes no difference if they were dumping 10,000 pounds of BOD in the stream, if the stream can only take one pound, I'll do my best to enforce it in the court. This is what adequate treatment means.

Mr. Banks: Who does the monitoring.

Mr. Jones: There is no monitoring at the present time because we are running about one-third of the staff that we need to carry on a program and we have gone to the legislature for three years with this story, we've gotten nowhere. We are asking again this year. If you want a program, write your senator and representative. Without money, there will not be an adequate program.

Mr. Banks: The Environmental Action Council is very much for the additional funds.

Mr. Jones: Why don't you write your representative?

Mr. Banks: I intend to, but I would like to state it on the record, that we give you wholehearted support on that. Is it possible, if such funds are not forthcoming, to have some type of private firm be selected to do the monitoring at the expense of the municipality or industry doing the polluting?

Mr. Jones: Well, I was wrong in saying there is no monitoring. Actually I would imagine 85% of your sewerage systems are now running effluent monitoring figures. These are sent in once a month. A reputable chemist will spend time with the operator making sure of the accuracy and in general the results are good. On every major industry in this area, and I think State-wide, we're getting either daily or two or three times a week reports that are sent in. I was thinking more of the analytical monitoring that we are doing. The whole thing involves money, it can be done cheaper through the central organization of the State, although we would prefer somebody set up a private lab and run all of this and certify the results to us.

Mr. Banks: I imagine the reports that you get specify certain types of toxic substances? What toxic substances are monitored?

Mr. Jones: I can't answer that. There are somewhere around 3,000 toxic materials. This is quoting some chemist recently. They monitor each effluent

depending on what is in it. If it is a plating plant with chromium, copper, zinc, cyanide, we run those tests. We do not run the material that is not there. We don't take hearsay, we simply check the records of the company. We do frequently find trace amounts of other materials in the effluent that aren't supposed to be there. Iron waste coming in from part of South America will contain zinc so you can expect zinc in the effluent in that particular plant. In general, what we are trying to do is measure what is being discharged.

Mr. Banks: Another thing which has not been mentioned is whether the eutrophication of the streams has been considered - the result of nitrates, phosphates and other organic fertilizers being washed away from the land.

Mr. Jones: I personally have been working on this since 1936 with TVA. I was working for them then and as each dam was built, it was speculated we would have a beautiful mass of algae. This did not take place. Studies were started back in 1936, in fact they were already started when I came to TVA. There have been very few places that we have had eutrophication. We've done some studies on it, we can show you a few embayments with it, but the major streams we have not had trouble with.

Mr. Banks: It is interesting that TVA estimates life in their artificial waterways somewhat over 100 years.

Mr. Jones: I don't believe this because up until 1945, I helped write those reports, and I don't think some of those reports have been changed since then. They've done a lot of work since then but the conclusion is still the same, the nitrogen and phosphorous going into the streams go straight on through. These are flowing through reservoirs, they are different than the Great Lakes.

Mr. Banks: One other comment. I'd like to urge the potential inclusion of the - how did you put it - "sacred streams", Obed, Clear Creek and Daddy's Creek, in the National System of Wild and Scenic Rivers which was the bill PL 90-542 passed in 1968. I realize that the inclusion is under study by the Bureau of Outdoor Recreation. This is a must priority. Thank you for your time.

Mr. Jones: I thank you for your comments, you've given us some questions that people have got on their mind and sometimes don't always ask. We're glad to have the questions.

Donald Jared, also a biologist with Environmental Action Council of Oak Ridge, indicated that he would like to make a comment.

Mr. Donald Jared: (Portion of comment inaudible) What is the possibility of putting in holding ponds and neutralizing the waste before it is discharged to the stream?

Mr. Jones: It's a good possibility. Any strip mining industry now that is dumping acid mine waste or silt into a stream that does not have a permit from the Board is operating illegally under State law and can be carried into General Sessions Court and fined \$50, or to the Grand Jury in the Criminal Court and fined up to \$500 per day, and I guess Chancery Court for injunction, and I guess under Game and Fish law, \$50 per day. There are plenty of laws that will cover it but then the question, why doesn't somebody do something about it. We've got too many things to chase and we do not keep up - this is the sad part of it.

I don't know the answer, unless somebody will put up a cash fund and hire somebody to neutralize the acid waste and precipitate the lime coming out. It can be done inexpensively, a few hundred dollars a year per mine. You go to the legislature and get us \$300 a year and either Dan or I, one, will see that this is done. You might say why am I telling you to go to the legislature. We've been three years and we're still operating on the same budget. We didn't do any good, maybe you can.

Mr. Roy T. Hall, Executive Manager, Cumberland County Chamber of Commerce at Crossville, is here and Mr. Hall has indicated that he would like to make a statement.

Mr. Roy T. Hall: I guess I probably shouldn't have volunteered to make a statement, I'm wearing about four hats today and the county judge said, you go to Clinton. Then the Watershed Development Association suggested I come along and make a statement about what we have done in water pollution. I guess I'm real happy I got in a little bit late, because had I heard all the problems that you folks down in the valley have, I probably would have turned around and went back home. I did find out that you folks are making some headway on getting this done.

This is an excerpt from the study that we made in 1967 and, if I may, at this time, I'd like to read it. This is from the Board of Directors of the Emory River Watershed Association.

We are pleased to participate in this hearing concerning the classification of the waters of the streams of the Clinch River drainage basin. The Emory River Valley Watershed Association is concerned with quality development in the region and in particular, in the Cumberland, Morgan and Roane Counties. Without clean water, area development will lag, falter and fail. We hope to maintain our clean water streams and improve the quality of the rest. In this effort, the Tennessee Stream Pollution Control Board can assist the people of the area in the protection and upgrading of our environment and I believe you've told us how we could do this. In 1967, an inventory of urban and suburban water usage in the Emory River watershed showed an average of 95 gallons per day per capita water used. At that time, the projected average daily per capita use for 1977 was estimated at 111 gallons. The annual urban and suburban use in 1967 for a three county area was 4,140 acre feet expected to rise 6,177 acre feet in 1977. This projection not considers increased daily per capita use but population increase of 10,767 persons over the ten year period. For 1967, the industrial water use by self-supplying industries was 4,136 acre feet annually and expected to reach 6,055 by 1977. In 1967, some 214 acre feet of water was used for irrigation on 427 irrigated acres. This amounts to some six inches per acre for the lands irrigated. It has been estimated that by 1977, 900 acres of land will be irrigated and would use 450 acre feet. Now if the 1977 crop season was dry, the water use would be 600 acre feet. Rural domestic water use in 1967 was some 2,700 acre feet per year. In 1977, this is estimated to be 2,565 acre feet per year. The rural domestic water use of all projected water uses is expected to lessen. Why that is, I don't know, maybe they're not going to drink as much water. As has been noted, all other uses are expected to increase. Although the quality of most of the water under consideration is generally good and there are some pollution problems that inhibit quality growth and development, it is to be expected that continued efforts be made in correcting these pollution problems and that existing high quality water

not be permitted to deteriorate. This again, I think is what we were talking about on the river, trying to keep it from deteriorating further from what it is now. Specifically cited as streams requiring vigilant attention are, as we've mentioned here before, the Obed River below Crossville. Incidentally, that plant is in operation now. Crab Orchard Creek and Crooked Fork Creek are subject to acid drainage from the mines, with particular attention to the acid concentration that appears with low stream flow. In the summertime, when these creeks do get very low, this is when this acid builds up in the streams and I'm sure that nobody's more aware of this than Mr. Jones, and I'm sure that most of you folks are aware that there is a dead place in the river down around Harriman. General dumping of solid wastes along the banks and into flood plains at the end of the river above Harriman. This dumping is practiced by unknown individuals and at least one industry. Percolation through these refuse heaps contribute to the water pollution. Control of and required treatment of runoff from refuse disposal sites is needed.

This study was made in 1967 and we have quite a book out on that. We have worked long and hard to try to keep this thing under control in cooperation of the TVA and I don't think anybody is more interested in control of their area than Tennessee Valley Authority. In our particular county of Cumberland, is where some of these inactive muskellunge are found, to us they are jack fish. I think the Game and Fish Commission has done a lot of work on this, in that area and especially in the Catoosa area, which is in Morgan County and Cumberland County. I don't know what your population in Anderson County showed, increase or decrease, we had quite an increase in Cumberland County this time and this is the thing that we're faced with. The people are going to be here, we went out and worked hard to get them here - to bring them into this area, and it is still one of the most beautiful areas in the world, even if pollution has gotten into the Tennessee Valley. Are there any questions you'd like to ask about this subject? If not, Mr. Jones, that's the end of my statement.

Mr. Jones: Mr. Paul Howard, State Conservationist, has some remarks that he would like to make.

Mr. Hearly W. Tucker: I'm Hearly Tucker, District Conservationist, here in Anderson County. Mr. Paul Howard is our new State Conservationist and he's got a statement for this meeting and I would like to read it at this time.

The Soil Conservation Service of the U. S. Department of Agriculture is vitally interested in water use and management, and stream pollution control. All programs of the Soil Conservation Service are directly related to this matter. We commend you for calling public hearings to discuss this most important subject.

The Department of Agriculture's report to the President last year on agriculture-related pollution contained this paragraph:

"From the standpoint of quantity, sediment resulting from erosion of the land is the greatest contributor to pollution of surface waters. The affect of this pollution by sediment is expressed in the impairment of the quality of the water and the damage caused where the sediment comes

to rest. The harmful effects are many -- some physical, some chemical, and some biological."

Other sources of water pollution have drawn more attention than sediment, particularly the dumping of raw or partially treated sewage into our streams and the spewing forth of industrial poisons into our rivers.

But sediment also is a menace to the quality of water. It clogs our streams, silts in our harbors, fills our lakes and reservoirs with mud. It destroys opportunities for recreation, raises the price of water and electric service, and causes floods.

Much of the sediment which fouls our water comes from agricultural land. This has been a national concern for more than a generation, and we are making encouraging progress in dealing with the problem.

In recent years, however, an increasing load of sediment has been washing from construction sites, from developing areas around cities where farms are turning into housing developments and shopping centers, from highways and airports. Soil erosion can increase dramatically on land being converted to suburban uses -- sediment discharges of up to 25,000 tons a square mile annually have been recorded.

The sediment load from these critical areas is in part a result of technological advance, made possible by the development of massive earthmoving machines capable of scraping away acres of soil-binding cover in a few hours. But it is also a result of the indifference or lack of information of builders and public officials. Sediment need not be the unavoidable price of land development. Sediment on construction sites can be controlled, in many cases with modifications of the same practices used so successfully on farms.

As we move into the 70's, we see the leadership of the major conservation forces evaluating their programs and setting goals for the decade ahead. This increased interest by so many groups in what is happening to our natural resources calls for the highest order of planning and performance on the part of conservation bodies, official and private.

All the needs and problems and desires must be balanced and accommodated in a course of action that will meet the growing demands on a non-expanding land and water resource base. While providing for essential production needs, good resource planning must consider also the needs for beauty, open space, and outdoor recreation.

Many interests must be blended and many people must be involved. As we go into the 70's, local leaders and professional conservationists need to encourage more urban participation, especially where most citizens already live in cities, towns, or suburbs.

We all know that conservation problems don't stop at the boundary lines of a city any more than water stops flowing as it moves from rural to urban areas, or vice versa. Businessmen, housewives, doctors, are concerned with land use decisions that affect them and their children.

These people know something about floods; they worry about pollution; and they recognize the despoiled landscape that results from soil erosion in too many urbanizing areas.

The Soil Conservation Service for years has worked with local conservation districts and with men and women in other conservation groups to improve the environment, especially in rural areas.

We have a major role to perform in this matter in the future, in both rural and urban areas. We must, of course, confine our activities to the specific purposes for which we are authorized to spend public funds.

These activities include watershed and river basin programs for flood prevention, watershed protection, recreational and fish and wildlife development, municipal and industrial water supply, and agricultural water management. Also included are soil surveys and consultive and technical assistance to landowners, groups, and organizations, both public and private, in planning and carrying out resource conservation and development programs.

In carrying out our assigned tasks, we have an obligation to see that they contribute the maximum to our common goal of an improved environment for human living.

Thank you for the opportunity to present this statement.

Mr. Jones: Mr. Carleton E. McMullin, City Manager of Oak Ridge.

Mr. Bob Casey: My name is Bob Casey, I'm assistant to the manager at Oak Ridge. Mr. McMullin has a prepared statement, unfortunately, he and the mayor had to leave for a previous commitment in Knoxville.

The City of Oak Ridge would like to welcome the State Pollution Control Board to Anderson County, and to encourage your close review of the uses of the tributaries of the Clinch River. As I will indicate later in my remarks, the Clinch River is a vital waterway to the City of Oak Ridge providing not only water for the consumption of our residents, for use at the installations of the Atomic Energy Commission, and for extensive recreation facilities for Oak Ridge and the citizens of the Knoxville Metropolitan Area, but also providing capacity for our waste water treatment facilities. My remarks this morning will cover the following points:

1. Basic information concerning the drainage basins in the City of Oak Ridge.
2. Basic information concerning the City's sewerage system.
3. Information concerning the sewage discharge into the tributaries of the Clinch River and
4. Information concerning the plans of the City of Oak Ridge for its sewerage system.

1. Drainage in the City of Oak Ridge. The attached map provides information on the land use of the City of Oak Ridge and the two tributaries of the

Clinch River which are utilized by the City in its sewerage system. The following points are germane when reviewing this map: (a) The vast majority of the area fronting on the Clinch River is owned by the Atomic Energy Commission, the Tennessee Valley Authority, and the University of Tennessee; and (b) the City's two sewage treatment plants are located at the eastern boundary of the City on an unnamed tributary of the Clinch River and on the East Fork Poplar Creek at approximately the boundary between Roane and Anderson Counties. As you will note from the map, the East Fork Poplar Creek serves a drainage basin which begins in Bear Creek Valley, extends through Gamble Valley and runs the length of the East Fork Valley. The dividing point between this drainage basin and the one flowing easterly through the East Sewage Treatment Plant is a line along Lafayette Drive and New York Avenue. Below the West Sewage Treatment Plant on the East Fork Poplar Creek, there are only two private property owners, one being the Oak Ridge Sportsman's Association and the other being the Oak Ridge Country Club. The residual of the land bordering the creek is owned by the Atomic Energy Commission and is not generally accessible to the public. The land downstream from the East Sewage Treatment Plant is owned by the City of Oak Ridge and the Atomic Energy Commission.

2. Basic Information on the Sewerage System. The sanitary sewerage systems of Oak Ridge consists of a collection system of approximately 190.8 miles of sewer mains and two sewage treatment plants. The East Sewage Treatment Plant is located on Parcel 278 containing 43.05 acres. The plant is of the activated sludge type, designed to provide complete treatment so that the effluent discharged into Melton Hill Lake is in a suitable state to eliminate contamination. Located at this plant is a laboratory which monitors the operations of both sewage treatment plants. The East Sewage Treatment Plant has a rated daily capacity of 1,500,000 gallons and an actual average daily capacity of 701,300 gallons.

The West Sewage Treatment Plant is located on Parcel 348, containing 47.18 acres. This plant is of the primary treatment type treating domestic and the Atomic Energy Commission Y-12 plant sewage. The plant is designed to treat 5 million gallons per day and has an actual average daily usage of 2,611,300 gallons.

3. Information on the Stream Flow and Effluent. There is a gauging station on the East Fork Poplar Creek approximately four miles downstream from the treatment plant. The drainage area at this station is approximately 19.5 square miles and the drainage area at the West Sewage Treatment Plant is approximately 13 square miles. According to the Department of the Interior Geological Survey dated 1968, for the years 1960 through 1968, the flows for the East Fork Poplar Creek at this station are: average - 13.7 cubic feet per second; high - 1,420 cubic feet per second; and low - 11.4 cubic feet per second. The average volume of sewage treated during dry weather and low stream flow is approximately 2 million gallons per day. This low flow is infrequent, having occurred only two times in the eight years for which the study was conducted. The Biochemical Oxygen Demand above the plant is 1 to 3 parts per million and below the plant is 1 to 7 parts per million. The Dissolved Oxygen above the plant averages 8 parts per million with a high of 9 parts per million and below the plant it averages 6.3 parts per million with a low of 4 parts per million. There have been only two occasions in the past three years when the D.O. has fallen below 5.5.

The BOD above the East Sewage Treatment Plant has an average of 1.7 parts per million and a high of 3.0 parts per million, while below the plant, the average is 3.3 parts per million and the high 5.0 parts per million. The DO above the plant has a low of 7.5 ppm and an average of 9.0 ppm, while below the plant, the low is 7.5 ppm and the average is 8.0 ppm.

4. Plans of the City of Oak Ridge. The City of Oak Ridge has completed a feasibility study for the construction of secondary treatment facilities on the East Fork Poplar Creek, and is projecting that this improvement will be constructed in Fiscal Year 1974. However, the construction of this plant is contingent upon the receipt of State and Federal grants-in-aid.

In view of the importance of these two tributaries of the Clinch River to the utility system of the City of Oak Ridge, the City request the State Pollution Control Board classify these tributaries so as to permit their continued usage for the discharge of effluent from the sewer system of the City. Due to the fact that we have not finalized the financing of the improvements to the West Sewage Treatment Plant, it is necessary for the classification of this stream for the near future to continue to allow the operation of the primary plant. This continued operation will not adversely affect any known development in the City. The Board of Directors of the Oak Ridge Country Club has discussed the possibility of developing housing near the East Fork Poplar Creek; however, these developments have not progressed to the point where we can indicate their exact location relative to the sewage plant and the creek. In addition, due to the natural aeration process to which the effluent is subject between the West Sewage Treatment Plant and Watts Bar Reservoir, the water quality of the East Fork Poplar Creek at the point where it enters the Reservoir is in no way detrimental to the water quality of the Reservoir.

I would like to thank the Board for their consideration in this matter and I would be happy to answer any questions that you might have.

Mr. Jones: Mr. Frank Daugherty, Manager of West Knox Utility District is here and I believe that he has some comments.

Mr. Frank Daugherty: I meant to ask you a question but you already answered that question awhile ago. But I believe we were left out as having any intake on the Clinch River; we do have an intake about a mile below Bull Run Steam Plant where Bull Run Creek runs into the river. Incidentally, this was put in before the lake was impounded and we go completely to the bottom of the river. We have about 4,000 connections and we can pump about 2,000 gallons of water per minute from the river and we have a spring we can pump about 200 gallons a minute from on Walker Springs Road. We have got 150,000,000 gallons of storage above the ground. I just wanted to get that in the record, I don't know why we were forgotten but thank you.

Mr. Jones: We didn't intend to forget you. I'm glad you reminded us about that. We'll have that in the testimony.

Mr. David A. Steiner had some testimony but he's not here and I think Bill Seawell is to read his statement that he sent over. Will you come up, sir?

Mr. Bill Seawell: First of all, I would like to make a couple of comments relative to the East Fork of Poplar Creek. First of all, I believe oxygen levels below the sewage treatment plant reach below 3.0 parts per million. In fact, I picked them up there in the summer a couple of times, 2 and 3 parts per million. Earl Leming and I looked at the creek last Friday. Below the Y-12 plant all the way to the sewage treatment plant, there is apparently very little aquatic life, very little fish life and just a few aquatic insects. It apparently recovers a little, three or four miles below the treatment plant though. Now, I'd like to read the statement by Dr. David Etnier, University of Tennessee, Department of Zoology.

Gentlemen: I am sorry that prior commitments prevented me from attending the hearing this morning. I do have very strong feelings concerning water quality in the Clinch, Powell, and Emory River systems, and am delighted to have this opportunity to have these feelings voiced in my absence.

Many species of the largely endemic fauna of clams and snails have already been eliminated or nearly eliminated from the Clinch-Powell River system. The fish faunas of the river systems under consideration today also includes a number of endemic species. In the comments to follow, I will consider certain aspects of these fish faunas.

Emory River System: Water quality in this system continues to be threatened by coal strip mining activities. The Obed River is virtually a sterile stream at and above the Interstate Highway 40 bridge in Cumberland County, but has an apparently healthy fish fauna farther downstream. An economically valuable species, the native river muskellunge (Esox masquinongy - Mitchell) persists in Tennessee only in this river system and in the adjacent Big South Fork and Obed River systems. It is apparently in danger of extinction in each of these systems. Loss of this stream/river-adapted form of the muskellunge, before we can assess its potential value as a trophy fish for other streams and rivers in the State, would deprive us of a native species of unknown but possibly great potential. The spotfin chub (Hybopsis Monacha - Cope) should definitely be considered an endangered species. Excellent populations of this rare minnow occur in the Emory River between Wartburg and Oakdale. Although it formerly occurred in several other streams in the Tennessee River system, the only recent records of the species from other river systems are from the North Fork of the Holston River, near the Tennessee-Virginia border, where pollution is a serious problem. Very few specimens have been collected and none have been taken within the past ten years or so. Should the population in the Obed system disappear, it would be very difficult to demonstrate that the species was not extinct. The ashy darter (Etheostoma cinereum - Storer) and the olive darter (Percina Squamata - Gilbert and Swain) are not immediately threatened by extinction, but each is known from the Emory system and only one or two additional tributaries to the Tennessee River, although both occur in a few localities in the Cumberland River system.

Clinch-Powell River System: An undescribed shiner (Notropis - sp.) that is currently being described by Dr. Robert Jenkins of Roanoke College, occurred in Cove Creek prior to construction of Norris Dam. Its present world-wide distribution is the lower half of the Little South Fork of the Cumberland River.

The yellowfin madtom (Noturus flavipinnis - Taylor) was thought to be extinct since it had not been collected since 1893. It was recently rediscovered in Copper Creek, a tributary to Clinch River in Virginia, by Dr. Jenkins. The slender chub (Hybopsis cahnii - Hubbs and Crowe) is a rare species endemic to the Clinch-Powell River system. Although it was discovered in 1939, only 15 specimens had been collected prior to 1966. It is an obligate inhabitant of clean gravel riffles in large rivers, and should also be placed on the endangered species list. Any deterioration of the few remaining habitats of this nature in these rivers would probably result in immediate extinction. The popeye shiner (Notropis ariommus - Cope), the tippecanoe darter (Etheostoma tippecanoe - Jordan and Evermann) and several larger species such as the paddle fish, lake sturgeon, river redhorse, and shorthead redhorse are in less danger but have very few additional refugia in the State of Tennessee.

While the economic significance of most of the species of fishes considered in this report is currently very slight, I feel that they have considerable aesthetic value. The continued presence of some of these less common species in our river systems might be quite useful as an index to the water quality of the river system.

Thank you very much. That's the end of Dr. Etnier's statement.

Mr. Jones: Mr. Harry B. Rowe, the Director of the Clinch-Powell River Association is here from New Tazewell and Mr. Rowe, will you come up, sir?

Mr. Harry B. Rowe: I'm with the Clinch-Powell River Valley Association which is interested in the development and conservation of the physical and human resources of Hancock, Claiborne, Union, Campbell, and Anderson counties. I don't have a lengthy presentation, I'm requesting permission to mail one in to the Board and it will cover our interest in areas of silt and acid drainage from agricultural and mining operations and contamination of the runoff waters into the streams by the indiscriminate disposal of household waste, commercial and industrial waste and solids along the banks of the streams and into the sinkholes which presently contaminates underground sources of water such as caves or underground streams. I thank you.

Mr. Jones: Thank you, sir, and this information that you plan to send us we will put in the transcript. Mr. Reid Gryder, President, East Tennessee White Water Club at Oak Ridge, marked his card that he would like to present some information.

Mr. Reid Gryder: I was making an additional note when you called me so I'm lost at the moment.

As president of the East Tennessee White Water Club, I directly represent approximately 100 families who canoe on the streams that we are discussing today, and indirectly I represent perhaps the other canoeing organizations within the State of Tennessee, organizations from other states which visit us on occasion, perhaps even the boating industry and canoeist who are non-members of any organization and maybe I even represent generations which are yet unborn. All of us believe that our streams should be maintained in the highest quality possible. The cost, we realize, is going to be expensive but we feel like it

is necessary. We enjoy varied and exciting sports on our streams, we enjoy simple float trips, scenic cruises and excitement in running rapids. A lot of us old men get a great feel of recreation and pleasure just from the adrenalin build up that we have in running rapids on weekends, whereas we sit in offices throughout the week. We are interested in improving the water quality in all canoeable streams which includes most of those listed in the folders which you see. We use these streams for recreation, for canoeing, whether or not they appear in this folder as recreation streams - as classified for recreation. The fact that a sewage plant is there deters a lot of people from canoeing but not everybody. There are people who will go ahead and canoe that stretch of river just because they want to see what unusual scenic features are being destroyed or impaired by the pollution which is present from sewage treatment plants. The main reason I am here making a statement, is to point out that the Obed River watershed is being studied by the BOR for inclusion in the National Wild and Scenic Rivers Act, Public Law 90-542. The coliform count required for classing a river as a wild river under this law, the fecal bacteria count, is a mean of 200 per 100 milliliter sample. I noticed in your criteria for the State, the recreation quality is set at 5,000 for the same size sample which is 25 times the count allowed for classification of a wild and scenic river. Oddly enough, the count for an intake to a water system is twice that for recreation which is perhaps because it is treated before it is drank. I think we can plainly see, that the recommendation for stricter criteria for recreation quality water is in order. Mainly, we should be more consistent with the national criteria, especially in the Obed watershed which I think is our primary quality. The Obed contains some beautiful white water canoeing streams and it's perhaps the best scenery in the Eastern United States along a totally wild river. Those of you who are not familiar with this river should take up canoeing.

Strip mining is incompatible with wild and scenic status in the National Act and we applaud the Game and Fish Commission's stand to prohibit strip mining on Clear Creek and the Obed River, we would also add Daddy's Creek, Whites Creek. It's too late to do anything about the Emory River or Crab Orchard Creek or Crooked Fork Creek, but these also are delightful canoeing streams that we enjoy. One of your staff members, Mr. Jones, made the statement that in 1944, the population organic equivalent of waste in this watershed was 11,000 and some units, I've forgotten. In 1970, it's 20,000. This is progress? In view of population increases, it may be progress but we canoeists wonder just how much progress our streams can stand before they become sterile. Another point I'd like to make concerning the statement from Carlton McMullin, City Manager of Oak Ridge, which was read by Bob Casey. It has many statements contained therein which are of questionable accuracy as pointed out by Bill Seawell and there are many statements which are deliberately designed to deceive. I think that this attitude is very common among people who are dumping sewage into your streams, and it is perhaps your biggest problem in water pollution control.

Another item which contributes considerably to the water pollution which was mentioned only briefly by, I believe, the gentleman from the Emory Watershed Development Corporation, is the disposal of household garbage along river banks. This is a very common practice in East Tennessee and it contributes greatly to the water pollution in your area. I don't know what can be done about it but we certainly need some kind of control on the disposal of household garbage, refrigerators and old cars, which are simply pitched into the nearest river. Sanitary

landfills are practically impossible for rural areas, but some sort of disposal location should be established.

In conclusion, I would like to say that canoeists have the very best opportunity to observe and watch for water pollution because they are usually the first persons that notice it. If we can ever be of any help to you in your job, Mr. Jones, we would appreciate your contacting us. We thank you very much for the job you've done and for your efforts thus far. Thank you.

Mr. Jones: Thank you, and we'll be calling on you.

Who was the organization that set the 200 per 100 milliliters limits?

Mr. Gryder: The National "Wild and Scenic Rivers Act."

Mr. Jones: In the act itself?

Mr. Gryder: Yes. This is the criteria established. It would be very important that the Obed River be qualified in the wild river status.

Mr. Jones: Well, there would be nothing going into the stream without a high secondary treatment and chlorination. This 1,000 figure is a farce and I state it because we picked it by flipping a coin in Atlanta. This is the only way in the world you can pick bacteriological standards - quote the Federal government and the other 49 State governments. All the southern states flipped a coin in Atlanta to pick 500 or 1,000 or 2,500 and I've forgotten how you flip a coin to take one out of three but we did it. We also met in Kansas City with Mr. Quigley before he went out of office, with the top scientific experts, on picking coliform or rather fecal coliform which is a much better indicator of the danger. There was no one in the United States who had any sensible figure to suggest. Two top people in the country, Glen Walker and Dr. Katz, who spent their whole lives working on it, frankly had to admit they did not have any figure to suggest. We had to pick a figure by June 30 so we flipped a coin. Too many of the standards are picked like that. The only safe figure is zero that you could back as being safe and you will not get a zero in any stream. This is one of the things that we are up against on the standards. I will get a copy of this act and I'll look into the 200 figure. We are shooting for the lowest figure. I'm not criticizing the statement, I agree with it, we will still shoot for the maximum degree of treatment on that stream.

Mr. W. T. Berg, East Tennessee White Water Club, marked his card - possibly. If you'll come to the mike please?

Mr. W. T. Berg: I would like to ask the Stream Pollution Control Board what efforts are being made to locate and, if possible, remedy pollution runoff in the streams as a result of farming or timbering operations? I have a particular stream in mind and that is Clear Creek. Up to about two or three years ago, even in very high water, Clear Creek was "clear creek". I didn't see how it was possible to have a creek almost in flood stage that remained as clear as it did. Now, for the past two or three years, with the slightest rainfall or increase in river level, Clear Creek looks like "coffee with cream" and as yet, I have not been able to

locate this source of siltation. The second question I'd like to ask - what can individuals do? Is the Board interested in having individuals, on their own, run down and report sources of pollution in streams?

Mr. Jones: Second question first. We'd be very glad to get sources. Please don't write and say, "Somewhere in this county there is a point that something is being discharged". This makes it rough for us; name the location of the sites and the owner if you can. It saves us time if you can point out the place. In most cases, pollution is coming from a point source, either a sewer, an industry, a city, a house or something.

Now your first question, on soil erosion. We are not doing enough work and practically none. We'll try to find out on Clear Creek. To be honest, I don't know the answer on controlling soil erosion. I think the contracts on interstate highways say you should build a highway so there will be no soil erosion to effect the streams. I can't write specifications that would do that nor have I found anyone else that can. The minute you take the grass off the soil and it rains, you're going to get soil erosion. This needs to be looked into because it ruins many streams.

Mr. Paris Pace, President, North Anderson Utility District, Lake City, indicated that he would like to present some information.

Mr. Paris Pace: I am with North Anderson County Utility, Lake City, Tennessee. This is a section on the northern end of the county. Particularly, I am concerned about Coal Creek Area. The pollution in the streams in this particular area and others will be that from the strip mining. What could be done about some of these things? We also have large stream pollution that is being done by individuals dumping on creeks and river banks. We have beautiful mountain country and this area is being polluted with tin cans, private dumps and household waste which could be eliminated. It's been recommended to the county government that we've got to have landfills, where an individual can take his trash out to the landfill and have it taken care of. This is about all I have to say. We've heard a lot of interesting talk from the other fellows. I didn't think, until I got into the meeting, that there was so much interest in pollution in this part of the county. I might recommend one solution. We have consulted an engineer in Knoxville pertaining to the small sewer system for small areas such as Beech Grove which would be a gravity flow and have a private disposal plant. He says this can be worked, it's been talked for some time and that's just part of my thinking. I guess that's about all I have to say.

Mr. Jones: Thank you, sir, we have a number of public systems that are around 200 or 300 people, some smaller than that. On this refuse disposal, the State law set up the Refuse Disposal Section within the Health Department but the Section has no legal authority until next July. With the law on the books now, you cannot throw any refuse, any cans, garbage, etc., into any stream or the right of way of a highway or private property without permission. The penalty is \$25 fine and ten days in the workhouse. The problem is, how do you enforce it. The idea of the county sanitary landfill is very sound and many of the counties are starting these now.

Mrs. L. B. Russell, past president of Tennessee Citizens for Wilderness Planning, indicated that she has some comments.

Mrs. Liane B. Russell: Tennessee Citizens for Wilderness Planning applauds the Stream Pollution Control Board for its excellent efforts and appreciates the opportunity to testify at these hearings concerning water quality criteria and stream uses of the Clinch and Emory watersheds. We regard all the free-flowing rivers of Tennessee as precious assets and only wish we could speak at all the Stream Pollution Control Board hearings throughout the State.

However, today there is a special urgency, because among the rivers being considered here are some that rank among the best in our country and have officially been declared to be of national stature. These are the Obed and its two major tributaries, Clear Creek and Daddy's Creek. Tennessee can be proud that these rivers are among the only 27 from throughout the nation that are listed for potential inclusion in the National System of Wild and Scenic Rivers under Public Law 90-542, passed in 1968. The rivers are even now being studied by a team under the leadership of the Southeast Regional Office of the Bureau of Outdoor Recreation. Citizen organizations, like ours, are contributing much expert knowledge to this study.

These deep-gorge rivers are outstanding in their dramatic scenic beauty, the fact that their valleys are unspoiled and free of the works of man, the incredible variety of their vegetation and wildlife and the opportunities for true wilderness recreation that they provide. They qualify in every sense for the highest classification available under the provisions of the Act, that of "Wild River".

Tennessee Citizens for Wilderness Planning believes that the State of Tennessee should exert every effort to ensure that these rivers remain the unspoiled treasures that they are, and that they receive official National Wild River status with the greatest possible dispatch. Water quality is a very important attribute that must be maintained at the highest possible level, or, where necessary, must be improved.

Natural aeration in the rapid-rich Obed River presently counteracts the pollution contributed to the uppermost stretch by the Crossville sewage treatment facility and the pickling plant. Nevertheless, this pollution should not be permitted to continue, (we applaud steps already taken in this direction) and certainly no new sources of pollution to the system should be tolerated. This applies not only to the Obed, Clear Creek and Daddy's Creek, but to their many magnificent tributaries, such as Otter Creek, Fox Creek, White Creek, Little Clear Creek, and many others too numerous to name. We believe that water quality maintenance and improvement on the Obed and its tributaries should have the highest priority of this Board because of the national stature of these rivers. Citizens for Wilderness Planning heartily endorses the Game and Fish Commission's statement opposing all mining on these streams.

In addition, we should like to point out that the Emory and its other tributaries downstream from the Obed junction have great aesthetic and recreational value and are being considered for possible inclusion in various

governmental programs, such as a proposed State Trails System, and State or Federal Scenic Rivers Systems. Such tributaries as Island Creek, Crab Orchard Creek, and Clifty Creek, should be assured of the high water quality that their beauty deserves. Unfortunately, the upper Emory itself and Crooked Fork (which has two well-known waterfalls on it) contribute almost constant bad siltation and acid from strip mining operations in their headwaters. We urge that the State make every effort to remove this blemish from an otherwise outstanding river system.

In summary we urge:

(1) The highest possible priority in water quality control for the Obed and its tributaries, because these rivers have national stature and official national status under PL 90-542.

(2) Elimination of strip mine and other wastes from the Emory and the scenic tributaries that enter the Emory downstream from the Obed junction, because of the high aesthetic and recreational values of the entire system.

Mr. Jones: Thank you very much. Alton Brewer, Oliver Springs, indicated that he would like to talk.

Mr. Alton Brewer: The things I wanted to say have already been said.

Mr. Jones: Thank you, sir. Thank you for being here. We've had a statement sent to us by Max Young, Tennessee Department of Conservation. He is usually on tour with us but he had too many other meetings that he had to attend this week. It's a short statement and he asked me to read it into the record. This is his statement:

We are happy to participate in this hearing concerning the classification of streams within the Clinch River drainage basin. It provides us with an opportunity to express our continuing effort along with the Tennessee Stream Pollution Control Board in maintaining and improving the streams and waters of the State.

The Tennessee Department of Conservation has no statutory authority in the Emory River with the exception of one of its tributaries -- the Obed and its tributary, Clear Creek.

The portion of the Obed River beginning near Crossville, Tennessee, and flowing eastward through Cumberland and Morgan counties to its confluence with the Emory River; and including a major portion of Clear Creek also in Morgan County, has been designated by Congress for study under the National Wild and Scenic Rivers Act. The primary purpose of this act being to give emphasis to protecting the values which make it outstandingly remarkable while at the same time providing river-related outdoor recreation opportunities in a primitive setting.

The Tennessee Department of Conservation has no statutory authority in the Clinch River, however, the upper portion located in Hancock County will be

studied in the future as a possible addition to the Tennessee's Scenic River System.

The Department of Conservation wishes to state that the highest use classification possible to provide for unrestricted recreational use of these rivers is our objective both as the agency responsible for implementing the State Scenic Rivers Act and as a conservation agency of the State.

The Tennessee Department of Conservation will cooperate with the Tennessee Stream Pollution Control Board in every way so that the Clinch, Obed River, and Clear Creek can be maintained, upgraded and improved to its greatest potential.

This was a statement by Max Young, Tennessee Department of Conservation.

I believe that I had all the cards that were marked. If I missed someone or anyone else that forgot to mark the card would like to make a statement. (Pause.) We covered this very fast and we would be very glad to try to answer any questions. (Pause.) It's 12:40. We appreciate your patience, we are glad you were here. If you think of some questions when you get home, write and we'll try to answer them.

Thank you.

A P P E N D I X

Clinch River Basin Hearing

Clinton, Tennessee

RECOMMENDATIONS FOR WATER QUALITY USES AND STANDARDS FOR THE
CLINCH RIVER AND ITS TRIBUTARIES

Tennessee Game and Fish Commission
January 19, 1971

We are happy to participate in this hearing concerning the Classification of the waters under consideration. This is another opportunity for all involved agencies and concerned citizens to voice their desires for favorable water quality. The Game and Fish Commission feels particularly "involved" in pollution control because we are decreed to protect our fish and wildlife resources from all menaces. Water pollution is the greatest threat to our fishery resources because, without clean water, all other efforts to provide good fishing would be to no avail. We therefore utilize our many state-wide personnel and radio communications network in this work. For example, our officers monitor water quality at about 70 surveillance stations across the state. Through continued cooperative efforts with the Stream Pollution Control Board, other agencies and interested citizens, we hope to help maintain our numerous clean waters and improve the quality of the rest.

In applying water quality standards to our waters, let's remember to protect the foundation of every good fish population -- an adequate food supply. It takes roughly 10 pounds of mayflies, caddis flies, aquatic worms and other fish food organisms to produce just one pound of fish. These 10 pounds of organisms, in turn, require roughly 70 pounds of microscopic plants for their subsistence. The most desirable fish food organisms are in general more sensitive to pollution than are fish. It is therefore possible to starve out or force out the fish without our ever seeing a dead fish.

District fisheries biologists Little, Seawell and Tatum have recently completed a general survey of most of the streams of this basin. Their data provide the basis of most of this statement.

General Water Quality and Specific Problems

Fortunately, aside from acid mine pollution, relatively few industrial and municipal pollution problems exist in the Clinch watershed. Some of the existing problems are as follows:

1. Obed River - The Crossville sewage treatment plant has been severely polluting this stream for many years. It is understood that a new and expanded plant is under construction which should alleviate this problem. A food processing plant in Crossville a short distance upstream from the sewage treatment plant also pollutes the stream in the warm seasons with fruit and vegetable process wastes. Since this is one of the finest streams in the state (farther downstream), and designated as a possible scenic river, we are very concerned that these problems be solved.
2. East Fork of Poplar Creek - The Oak Ridge city sewage treatment plant severely pollutes this stream lowering oxygen levels.

By far, the most significant pollution problem in the watershed is acid mine water and siltation from deep mines and strip mines. With the recent fuel shortages, the threat will be much greater in the future. Although not yet a problem, even areas on such desirable streams as the Obed River and Clear Creek are under investigation for mining and ultimate pollution. A list of streams presently affected by acid mine water is as follows:

ANDERSON COUNTY

<u>Stream</u>	<u>Description</u>	<u>Miles Affected</u>
Coal Creek	Possible intermittent acid water over entire length.	10.3
Beech Grove Fork Creek	Possible intermittent acid water over entire length.	6.0
Poplar Creek	Upper 2 miles and portion immediately below Cow Creek severely polluted. Entire length subject to intermittent pollution during wet weather.	11.0
Brown Creek	Intermittent pollution during wet weather over entire length.	1.1
Lick Creek	Intermittent pollution during wet weather over entire length.	1.1
Bullskin Creek	Intermittent pollution during wet weather over entire length.	1.7
Stony Flat Creek	Intermittent pollution during wet weather over entire length.	2.4
Roaring Creek	Intermittent pollution during wet weather over entire length.	2.2
Mud Suck Creek	Intermittent pollution during wet weather over entire length.	1.5
Cow Creek	Severe acid pollution over entire length.	3.6
Indian Creek	Moderate acid pollution over entire length.	3.4
Little Cow Creek	Severely polluted by acid over entire length.	2.7
Wright Creek	Moderate acid pollution over entire length.	1.9
Taylor Creek	Moderate acid pollution over entire length.	1.4

CAMPBELL COUNTY

Big Creek	Intermittent acid pollution over entire length.	7.0
Ollis Creek	Intermittent acid pollution over entire length.	6.6
Ollis Creek Tributaries	Probably affected but extent is unknown.	
Laurel Branch		
Thompson Branch		
Yellow Branch		
Kent Branch	Intermittent acid pollution over entire length.	2.4

MORGAN COUNTY

Emory River	Moderate effect on fish.	20.0
Little Emory River	Moderate effect on fish.	3.0
Crab Orchard Creek	Moderate effect on fish.	7.6
Gallanger Creek	Light effect on fish.	3.5
Crooked Fork Creek	Light effect on fish.	19.0

Bletchers Creek	Light effect on fish.	4.5
Island Creek	Light effect on fish.	5.0
Rock Creek	Moderate effect on fish.	3.1
Middle Creek	Light effect on fish.	3.7

Total Miles Affected in Watershed (three counties)135.7

It is important to point out that strip and deep mining, even with precautions, results in a very high likelihood of acid mine pollution and siltation. It is important that mining techniques be refined and extreme care be exercised in future mining. The Game and Fish Commission is opposed to any mining whatsoever on certain prime fishing streams (e.g. Clear Creek, Obed River Daddys Creek).

Following is a table presenting surveillance data taken by Game and Fish Officers over the past several years on waters in the Clinch River watershed:

Stream	D.O. - % of Checks (mg/l)					# of Checks	pH - % of Checks					# of pH Checks
	3-4	5	6-8	9-10	>10		<6.0	6.0-6.4	6.5-7.4	7.5-8.5	8.6-9.0	
Emory R. Morgan Co.	2	2	6	38	52	48	4	13	79	4	0	47
Emory R. Roane Co.	0	1	1	1	97	108	0	31	68	1	0	137
Clinch R. Grainger Co.			17	53	30					96	4	47
Gap Creek Claiborne Co.	7	44	44	4				73	27			45

Norris Lake (TVA)

Norris Lake impounds over 34,000 acres of an area including the Clinch River and the lower end of the Powell River. It is considered of extremely high quality fishing for smallmouth and largemouth bass, walleye, crappie, white bass, bluegill, sauger and catfish. Muskellunge, rockfish, and rockfish-white bass hybrids have been introduced as exotic species. Norris is noted as one of the few lakes which maintains a high population of walleye through natural reproduction. A limited population of rainbow trout is maintained in the deep cold waters that contain sufficient oxygen for trout survival. In 1963, it was estimated that 312,000 fishing trips were made on the lake. Total catch for this year was estimated to be 625,000 fish weighing 495,000 pounds. An estimated \$1,457,000 was spent for these trips not including many "longterm" purchases for equipment, etc., not actually purchased on the day of the respective fishing trips.

Melton Hill Lake (TVA)

Also of high water quality, Melton Hill is a mainstream lake impounding the Clinch River below Clinton over 5,720 acres. Major species caught are largemouth bass, white bass, crappie, bluegill, muskellunge and catfish. Muskellunge releases have been made into the lake with limited return success.

Watts Bar Lake (TVA)

Although primarily a reservoir of the Tennessee River, Watts Bar also backs up 23 miles of the Clinch River and 16 miles of the Emory River. The entire lake covers 38,600 acres at full pool. Although somewhat handicapped by pollution, fishing is still good for crappie, largemouth bass, white bass, bluegill, channel catfish and sauger. Rockfish have also been introduced into the lake. A high population of rough fish provides substantial commercial fishing. Primary sources of pollution arise from municipal and industrial pollution and siltation from the Emory River.

Emory River

The Emory River runs approximately 50 miles (including Watts Bar impounded area) through Roane and Morgan Counties. The unimpounded portion is considered of fair fishing quality supporting typical cool-water species and limited numbers of natural muskellunge population. Float trips are popular on the upper reaches. The Emory River empties into the Clinch a few miles above its mouth in Watts Bar Lake.

Powell River

The other major tributary to the Clinch River, the Powell River, extends 115 miles from Campbell County (where it is impounded by Norris Lake), through Claiborne and Hancock Counties. It is also popular for float trips on the upper end. Good to excellent fishing exists for bass, sauger, walleye, rock bass, suckers, catfish and sunfish.

Clinch River

The Clinch River spans 175 miles including the impounded areas of Norris, Watts Bar and Melton Hill Lakes. Prime trout water is found in the first three to four miles of the Norris Dam. Fishing is good throughout the river for crappie, largemouth bass, white bass, bluegill, sauger, and channel catfish. A 100-acre rockfish and muskellunge hatchery is being planned on a recently acquired Game and Fish area adjacent to the Clinch River at Clinton. Yearly production of 625,000 2 to 4-inch rockfish and 3,750 12-inch musky is planned.

Major Tributaries

The better tributaries, rated to provide at least fair to excellent fishing are listed below. Some potentially good streams are not listed because pollution has caused poor or no fishing.

Tributaries to Clinch River

Stream	County Location	Length -Miles	Average Width	Fishing Rating	Primary Fish Caught
Poplar Ck.	NE Roane	12.7	10'	Fair	bluegill, minnows
Poplar Ck.	SW Anderson	15.4	20	"	rock bass, smallmouth bass
Poplar Ck.	"	11.2	17	Excellent	bluegill, minnows

Stream	County Location	Length -Miles	Average Width	Fishing Rating	Primary Fish Caught
Pawpaw Ck.	E Roane	4.3	5'	Fair	bluegill, minnows
Hickory Ck.	W Knox	7.0	4	"	rock bass, suckers, minnows
Beaver Ck.	"	35.0	10	"	carp, catfish, drum, rock bass
Bullrun Ck.	N Knox	13.0	20	"	smallmouth bass, rock bass, catfish
Bullrun Ck.	EC Anderson	6.7	25	Good	rock bass, smallmouth bass
Bullrun Ck.	S Union	16.5	10	Fair	rock bass, suckers, minnows
Dismal Ck.	EC Anderson	3.2	8	"	not available
Cane Ck.	"	4.4	14	"	rock bass
Blowing Springs Ck.	"	2.5	7	"	"
Raccoon Ck.	SW Union	5.2	5	"	minnows, rock bass
McCoy Br.	E Anderson	2.2	-	"	not available
Hinds Ck.	N Anderson	15.8	15	Excellent	rock bass, smallmouth bass, bluegill
Hinds Ck.	SW Union	5.4	5.5	Fair	rock bass, minnows
Buffalo Ck.	N Anderson	8.5	15	Excellent	rock bass, smallmouth bass, bluegill
Byrans Fork Ck.	"	4.6	16.5	"	rock bass, longear sunfish
Byrans Fork Ck.	SW Union	0.7	3	Fair	rock bass, minnows
Cove Ck.	SE Campbell	7.0	13	Excellent	rock bass, suckers, minnows, white bass
Shoffner Br.	S Campbell	1.8	3	Fair	minnows
Fall Ck.	C Union	2.2	5	"	minnows, rock bass
Williams Ck.	NW Grainger	7.5	10	"	sunfish, rock bass, suckers
Puncheon Camp Ck.	N Grainger	4.7	5	"	sunfish, minnows, suckers
Indian Ck.	NE Grainger	7.1	9	Good	bass, sunfish, suckers
Indian Ck.	S Hancock	2.9	6	Fair	sunfish, suckers
Barren Ck.	S Claiborne	6.2	N/A	"	rock bass, sunfish, suckers
Big Sycamore Ck.	SE Claiborne	9.5	15	Good	bass, rock bass, sunfish, suckers
Big Sycamore Ck.	W Hancock	6.1	10	Fair	bass, sunfish, suckers
Blackwater Ck.	N Hancock	15.6	14	Good	bass, rock bass, sunfish, suckers
Ball Ck.	S Claiborne	2.9	9	Fair	rainbow trout
Little Sycamore Ck.	SE Claiborne	8.6	10	"	sunfish, rock bass, suckers
Big War Ck.	S Hancock	12.8	17	Good	bass, rock bass, sunfish, suckers
Big War Ck.	N Hawkins	7.1	8	Fair	minnows, rock bass, suckers
Little War Ck.	S Hancock	4.2	5	"	minnows, sunfish
Stony Fork Ck.	SC Hancock	5.8	8	"	minnows, sunfish, suckers
Big Ck.	W Hancock	6.0	10	"	"
Swan Ck.	"	5.9	10	"	sunfish, suckers
Brier Ck.	C Hancock	5.2	9	"	bass, sunfish, suckers
N. Fk. Clinch R.	SE Hancock	1.6	8	"	sunfish, suckers, minnows

Total Miles 305.0

Stream	County Location	Length -Miles	Average Width	Fishing Rating	Primary Fish Caught
<u>Tributaries to Emory River</u>					
Little Emory R.	N Roane	0.5	12'	Fair	bluegills, minnows
Little Emory R.	S Morgan	9.6	40	Good	"
Bitter Ck.	SE Roane	7.1	20	"	white bass, sunfish, rock bass
Clifty Ck.	N Roane	6.6	10	Fair	smallmouth bass, rock bass
Crab Orchard Ck.	S Morgan	13.5	60	"	bass, rock bass, musky
Crooked Fork Ck.	SE Morgan	19.0	45	"	not available
Island Ck.	S Morgan	8.9	30	"	sunfish, rock bass
Obed R.	WC Morgan	13.0	40	Good	smallmouth bass, largemouth bass, rock bass, sunfish
Obed R.	NC Cumberland	30.1	20	"	smallmouth & largemouth bass
Clear Ck.	WC Morgan	15.1	20	Fair	musky, rock bass, smallmouth bass, sunfish
Clear Ck.	N Cumberland	26.4	14	"	"
N. Fk. Clear Ck.	NW Morgan	11.8	40	Good	"
Cook Ck.	"	6.8	30	Fair	"
Wilt Ck.	NW Morgan	4.4	20	Good	trout, musky, rock bass, sunfish
Stower's Ck.	"	3.9	15	Fair	smallmouth bass, rock bass, sunfish
Daddy's Ck.	WC Morgan	2.3	40	Good	rock bass, sunfish, musky, largemouth & smallmouth bass
Daddy's Ck.	C Cumberland	39.0	40	"	"
Byrd Ck.	"	8.1	8	Fair	smallmouth bass, sunfish
Stillhouse Ck.	"	1.1	8	"	"
Long Ck.	"	2.0	8	"	"
Buck Ck.	"	2.5	8	"	"
Yellow Ck.	"	8.1	8	"	smallmouth bass, sunfish, rock bass
Drowning Ck.	"	9.1	10	"	"
Little Obed R.	"	3.1	5	"	sunfish
Fox Ck.	"	6.1	6	Good	sunfish, smallmouth bass, rock bass
Otter Ck.	"	11.1	6	"	"
Lick Ck.	"	3.2	6	Fair	"
Mill Ck.	"	2.6	6	"	"
Rock Ck.	C Morgan	11.0	25	"	sunfish smallmouth bass, rock bass, musky
Little Rock Ck.	"	5.0	20	"	trout, smallmouth bass, rock bass
Greasy Ck.	"	6.2	40	Good	smallmouth bass, rock bass, sunfish

Total Miles 297.2

Tributaries to Powell River

Cedar Ck.	C Campbell	3.6	7	Fair	minnows, rock bass, smallmouth bass
Chambers Ck.	S Campbell	2.6	3	"	"

Stream	County Location	Length -Miles	Average Width	Fishing Rating	Primary Fish Caught
Davis Ck.	E Campbell	1.0	5	Fair	rock bass, smallmouth bass, suckers
Davis Ck.	W Claiborne	14.3	17	"	rock bass, sunfish, suckers
Old Town Ck.	NC Claiborne	9.7	13	"	minnows, sunfish, suckers
Gap Ck.	C Claiborne	4.7	8	"	"
Blair Ck.	"	6.4	11	"	"
Indian Ck.	N Claiborne	6.8	13	"	smallmouth bass, rock bass, suckers
Unnamed Tributary to Indian Ck.	"	2.7	8	"	sunfish, suckers, minnows
Russell Ck.	EC Claiborne	7.1	10	"	"
Mulberry Ck.	NW Hancock	11.5	14	"	sunfish, suckers, rock bass, bass
Total Miles		70.4			

Trout

Several streams in the Clinch River watershed maintain a trout population. A list of these is presented below. Several others, not mentioned, are of adequate quality for future establishment of a put and take trout fishery.

Clinch River Basin

Stream	County Location	Trout Stream Terminal Points	Segments Miles	Species	Stream Classification
White Creek	W Union	Mouth to mile 2.0	2.0	rainbow trout	Natural reproduction
Clinch R.	N Anderson	Norris Dam (CRM 79.8)- Hwy. 61 (CRM 66.2)	13.6	rainbow trout	Put, grow & take
Bacon Springs Ck.	Anderson	Mouth to mile 2.0	2.0	rainbow trout	Put & take
Clear Ck.	W Union	Mouth to mile 2.0	2.0	rainbow trout	Put & take
Big War Ck.	S Hancock W Hawkins	Origin to mile 8	11.9	rainbow trout	Put & take
Ball Ck.	S Claiborne	Origin to mouth	2.9	rainbow trout, salmon	Put & take, salmon eggs for imprinting
Total Miles			34.4		

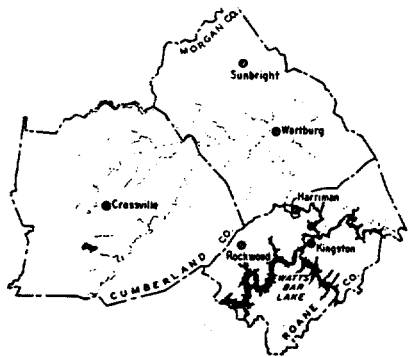
Summary and Conclusions

Although at least 135 miles of stream in the Clinch River watershed has been affected by acid mine pollution, most of the remainder of the water is of excellent water quality. It is only logical that the high quality be maintained and that diligent efforts be continued in the correction of the problem areas that exist. Special attention should be given to pollution abatement below certain sewage treatment plants and strict control on mining operations.

Three hundred and forty miles (including impounded water) of fair to excellent fishing exists on the Clinch, Powell, and Emory Rivers with 673 miles (not including impounded water) of fair to excellent fishing on the major tributaries to these three rivers. All species of game fish are found in various areas of the watershed. Thirty-four miles of the tributary streams are supporting put and take or natural trout populations. Several other streams are capable of supporting put and take trout fisheries with development. Other relatively rare species include muskellunge present primarily in the Emory River watershed and limited numbers of rockfish and rockfish-white bass hybrids in Norris Lake. Minor streams of the basin are also important in that they may: (1) provide localized fishing, (2) provide opportunity for bait fish collection, and (3) produce forage fish for use as food by larger fish of other streams.

Clean streams complement Tennessee's numerous large reservoirs in providing a balanced recreational resource. A clean stream's natural qualities cannot be duplicated. As an increasing number of our streams succumb to impoundment and channelization, those that remain are to be even more cherished. We therefore recommend that all streams under consideration be classified in accordance with the requirements of fish and aquatic life.

Prepared by: Daniel M. Sherry
Pollution Biologist



Emory River Watershed Development Association

Post Office Box 325

WARTBURG, TENNESSEE 37887

January 6, 1971

Mr. S. Leary Jones, Executive Secretary
Stream Pollution Control Board
Cordell Hull Building
Nashville, Tennessee 37219

Dear Mr. Jones:

With reference to your letter of December 18 announcing a public hearing on Tuesday, January 19, 1971 on the purpose of establishing water stand for streams on the Clinch River Basin, I would like to respond for the Emory River Watershed Development Association. This area development association is primarily concerned with the area drained by the Emory River which in turn empties into the Clinch. We are very much aware of the problems of the total area in regards to water quality with particular reference to water quality or pollution caused by man-made conditions.

In general, the Emory River and its tributaries do not have the pollution problem as many other tributaries of the Clinch with the exception of strip mining and deep mining pollution and to a minor degree that of sewage problems. Industrial contamination of this system is limited to industrial and sewage discharge in the area of Harriman. The towns of Crossville, Wartburg, Oakdale and other communities create only a limited pollution problem.

It now appears that no member of the board of directors of the Emory River Watershed Development Association will be in position to attend your public hearing on January 19, however, Morgan County will be represented by a number of leaders including Ross H. Williams, Jr., County Judge and several other people. I am sure that their concern is that of the Emory River directors in that they will be in position to talk and intercede for us. We would like very much to have a copy of the meeting minutes as well as the stands developed in order that they can be studied before any recommendations are finalized for the Clinch River System.

Yours very truly,

C. R. Jansch
C. R. Jansch
Secretary, ERWDA

CRJ:cmh



TENNESSEE TRAILS ASSOCIATION

Wartburg, Tennessee
P. O. Box 331
January 23, 1971

Officers

President

Donald E. Todd
P. O. Box 331
Wartburg 37887

Vice-President

Robert D. Brown
123 Blackburn Ave.
Nashville 37205

Recording Secretary

Mrs. David Hassler
Box 1
Byrdstown 38549

Corresponding Secretary and Treasurer

Mrs. John McIntyre
137 Highland Ave.
Oak Ridge 37830

Directors

F. R. Bruce
116 Euclid Circle
Oak Ridge 37830

Roy Hall
Chamber of Commerce
Crossville 38555

E. W. Means
200 Butler Road
Oak Ridge 37830

Mr. S. Leary Jones, Executive Secretary
Stream Pollution Control Board
Cordell Hull Building
Nashville, Tennessee

Dear Mr. Jones:

The Tennessee Trails Association most heartily endorses the position of the Tennessee Game and Fish Commission that strip-mining should be prohibited in the Obed River watershed. This river and its major tributaries have reached national stature and nothing but the highest water quality standards should be established.

In addition to the endorsment of our organization, I would like to add my personal endorsment to this ban on stripmining. I am a resident of Morgan County, which contains a major portion of the Obed watershed. Maintenance of high water quality in this river is of personal interest to me as well as to many other residents of this county.

I would like for this letter to become a part of the record of the hearing to establish water quality standards for the Clinch River Drainage Basin that was conducted in Clinton on January 19, 1971.

Sincerely yours,

Donald E. Todd
Donald Todd, President
Tennessee Trails Association

48
OAK RIDGE

OR

TENNESSEE

MUNICIPAL BUILDING

37830 TELEPHONE 483-5671

January 26, 1971

Mr. S. Leary Jones
Executive Secretary
Stream Pollution Control Board
Cordell Hull Building, Room 621
Nashville, Tennessee 37219

Dear Mr. Jones:

Attached is a statement that was prepared for The Oak Ridger, our local newspaper, concerning the operation of the City's two sewage treatment plants. This statement was prompted by comments made during and after the public hearing sponsored by your agency in Clinton on January 19. Please consider the information in this press release as an addendum to the statement presented to the Board by the City of Oak Ridge on January 19.

If you have any questions regarding these matters or if you need additional information, please contact me.

Sincerely yours,

Carleton E. McMullin
Carleton E. McMullin
City Manager

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Attachments

Officials of the City of Oak Ridge are concerned with the statements made to the Oak Ridger concerning the operation of the municipal sewage system. These statements provide no substantiating data to which a direct reply can be made. However, since these statements questioned the intent and accuracy of the presentation made to the State Pollution Control Board on Tuesday, January 19, the City feels that a further explanation of the operation of the sewage system is desirable.

The City maintains a laboratory staffed by competent personnel at the East Sewage Treatment Plant. Both the East and West Treatment Plants prepare daily reports on the sewage flow through the system. In addition, the effectiveness of the treatment process is monitored daily by the laboratory technicians. Copies of all reports are forwarded to the State Health Department. In addition, this state agency monitors and verifies these reports and to the best of our knowledge it has found no inconsistencies in these reports.

Except for periods of very heavy rains the City is treating according to the capacity of the plants, all of the waste water collected by the municipal sewage system. This waste water includes the effluent from the water customers in the City, industrial waste water from Y-12 and surface water which infiltrates into the collection pipes. As was noted in the statement from the State Pollution Control Board, the capacity of the primary, West Sewage Treatment Plant is 5 million gallons per day and the

-more-

average flow in 1969 from the sewage system was 2.6 million gallons. In 1970 the average flow was 3.4 million gallons. The statement made by Mr. Gryder that the average daily sewage flow is 12 million gallons per day does not conform to the facts. A 12 million gallon per day sewage flow would be equivalent to the waste water from a city of 100,000 or more people. The City receives all of its water from the Atomic Energy Commission. This water is monitored closely by the Commission since the City is billed for its exact usage. Likewise the waste water from the Y-12 plant is monitored since the City bills the Commission for the actual gallons treated. In addition, interpolation of data accumulated in the Geological Survey by the Department of the Interior shows that the average flow of the East Fork Poplar Creek just below the outfall from the treatment plant is 20.5 million gallons per day. This flow includes the drainage from 13 square miles of land as well as the effluent from the plant and the discharges from Y-12. A discharge of 12 million gallons per day from the treatment plant would cause this stream flow to be considerably higher.

The City system does have a problem with infiltration and plant operation in periods of heavy rain. In 1970 the West Sewage Treatment Plant "bypassed" for a total of 52 hours. This bypassing is necessary for two reasons: (1) the waste water coming into the plant through the trunk lines is in excess of the plant capacity; and (2) the outfall lines from the plant are below the surface of the flooded East Fork Poplar Creek thereby prohibiting a plant discharge. During 7 of the 52 hours noted above the plant had to be completely bypassed. During the remaining hours the plant operated at its capacity and bypassed the excess waste and storm waters. Infiltration is common to all sewage systems. It is more of a problem in Oak Ridge due to the condition and

location of the trunk lines and the existence of numerous abandoned service laterals which used to serve the temporary housing in the City.

Mr. Seawell's comments concerning the oxygen levels in the East Fork Poplar Creek do not necessarily conflict with the statement made by the City. The information given by the City on the Biochemical Oxygen Demand and Dissolved Oxygen in East Fork Poplar Creek relates to the stream in the immediate vicinity of the plant while Mr. Seawell's statement implies his measurements occurred further upstream from the West Sewage Treatment Plant nearer the Y-12 facilities. It should be noted however, that the information given by the City is based upon tests conducted every two weeks throughout the year while Mr. Seawell conducted only a spot survey during the summer of 1970. It should also be noted that immediately downstream from the West Sewage Treatment Plant the lowest observed dissolved oxygen level was 4.0.

The City strives to operate its plants satisfactorily and this is recognized by the State Pollution Control Board. At the January 19 Public Hearing, this Board stated that the City operated satisfactorily but that the facilities were inadequate. The need for secondary treatment has long been recognized by the community. It is estimated that these improvements will cost in excess of \$3,500,000. However, before these improvements are made the City is awaiting the approval of State and Federal funds which will reduce the direct cost to the Oak Ridge citizens by more than 50%.

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UNITED STATES
ATOMIC ENERGY COMMISSION

OAK RIDGE OPERATIONS
P.O. BOX E
OAK RIDGE, TENNESSEE 37830

AREA CODE 615
TELEPHONE 483-3611

January 26, 1971

Mr. S. Leary Jones, Executive Secretary
Tennessee Stream Pollution Control Board
Cordell Hull Building
Nashville, Tennessee 37219

CLASSIFICATION OF CLINCH RIVER BASIN STREAMS

Dear Mr. Jones:

This office has recently had the pleasure of working with representatives of the Division of Stream Pollution Control and of attending the public hearing on Clinch River Basin stream classifications held in Clinton, Tennessee, on January 19. Since streams on the AEC-Oak Ridge reservation are included in the Clinch River drainage basin and since stream use classifications for these streams have been proposed by your Knoxville office, we would like to take this opportunity to comment on these proposals for the consideration of the Board.

Beginning in 1959, streams and land areas throughout the Oak Ridge reservation have been continuously used in ecological research including studies on radionuclide cycling in aquatic organisms, the structure and function of communities of bottom organisms, and, more recently, on the effect of watershed management on water quality. We feel that these studies are complementary to existing research programs elsewhere. This research requires undisturbed, protected areas to avoid public interference with expensive research equipment placed in the field and in some cases may require stream manipulation to achieve the required experimental results. We expect utilization of the various streams on the reservation to increase in the future in conjunction with generally expanded environmental research at the Oak Ridge National Laboratory.

As future research requirements are unpredictable and could conceivably necessitate technical violations of use classification criteria, as for example those associated with fish and aquatic life classification, it would appear of greater benefit to classify all streams whose headwaters, mouth and entire length are on the AEC-Oak Ridge reservation as "reserved research streams." If this cannot be done within the framework of existing Tennessee law, we would then propose that no classification be given these onsite streams.

Mr. S. Leary Jones

- 2 -


January 26, 1971

The White Oak Creek and its tributaries are a particular case obviously demanding of different classification. The White Oak Creek, as you are aware, was for years impounded for use as a settling basin for radioactive waste effluents. The stream sides and the old lake bed contain deposits of radioactivity which present a unique research medium. This creek and general area are closed off from public access and are appropriately posted.

Our Oak Ridge National Laboratory is in an excellent position to acquire needed information in the field of ecology and should have no difficulty in balancing research needs with the need to protect the aquatic environment being studied.

We feel that these comments are in the best interest of the public and hope that they will aid in your decisions. Also, these comments should not be construed as a mechanism for avoiding our AEC responsibilities for protecting the aquatic environment. We are firmly committed in this area, both programmatically and in regard to our pollution control programs.

Sincerely,


S. R. Sapirie
Manager
Oak Ridge Operations

OSW:HWH

UNION CARBIDE CORPORATION

P. O. Box Y
Oak Ridge, Tennessee 37830

NUCLEAR DIVISION

R. F. Hibbs
President

Oak Ridge National Laboratory
Y-12 Plant
Oak Ridge Gaseous Diffusion Plant
Paducah Gaseous Diffusion Plant

January 28, 1971

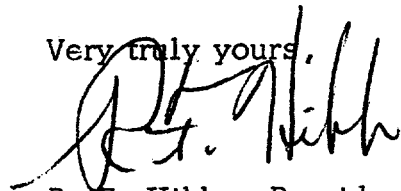
Mr. S. Leary Jones, Executive Secretary
Tennessee Stream Pollution Control Board
Tennessee Department of Public Health
620 Cordell Hull Building
Nashville, Tennessee 37219

Dear Mr. Jones:

We commend you and your staff for the outstanding way in which you conducted the public hearing on Clinch River Basin stream classifications on January 19 in Clinton, Tennessee. I understand that our representatives, along with those of the Atomic Energy Commission, have called to your attention the need for further consideration of the proposed classifications for certain streams in the Oak Ridge area.

As I am sure you are aware, our work here in Oak Ridge includes a number of ecological research programs which facilitate a better understanding of our environment and will make significant contributions for long-term improvement of it. A cleaner, more healthful environment is and must remain a primary goal for all of us.

Very truly yours,



R. F. Hibbs, President

RFH:mgwk

ATTENDANCE LIST

Arnurius, Armond	Superintendent, Norris Water Company, Norris, Tennessee 37828
Bank, Harvey	Chairman, Environmental Action Council of Oak Ridge, P. O. Box 3211, Oak Ridge, Tenn. 37830
Berg, W. T.	East Tennessee White Water Club, 395 East Drive Oak Ridge, Tennessee 37832
Billingsley, Marvin, Mayor	Mayor of Lake City, Lake City, Tennessee 37769
Bissell, A. K., Mayor	Mayor of Oak Ridge, Municipal Building, Oak Ridge, Tennessee 37380
Boshears, Douglas	Foreman, Key Limestone, Box 272, LaFollette, Tennessee 37766
Bowers, E. R.	Attorney, Union Carbide Corporation, P. O. Box Oak Ridge, Tennessee 37830
Boyd, Lou	Game and Fish Commission, P. O. Box 934, Chattanooga, Tennessee 37401
Brewer, Alton	Route #2, Oliver Springs, Tennessee 37840
Brewer, Carson	Reporter, The News Sentinel, Knoxville, Tennessee
Briggs, S. E.	President, Avondale Creamery, Box 24, Knoxville Tennessee 37901
Buttrom, David E.	Sanitarian, Roane County Health Department, P. O. Box 1055, Kingston, Tennessee 37763
Carden, Benny	Norris Water Company, Norris, Tennessee 37828
Cassell, S. S.	Water Services, P. O. Box 10126, Knoxville
Claiborne, Donn S.	Vice President, Key Limestone, Box 272, LaFollette, Tennessee 37766
Claiborne, Steve L.	Vice President, Key Limestone, Box 272, LaFollette, Tennessee 37766
Colborn, Gordon E.	County Engineer, Anderson County, Courthouse Clinton, Tennessee 37716

Attendance List - Page 2

Cole, Bill	Tennessee State Planning Commission, P. O. Box 1069, Knoxville, Tennessee 37901
Crouch, George E.	President, Crouch & Adams, Inc., P. O. Box 3114 Oak Ridge, Tennessee 37830
Daugherty, Frank J.	Manager, West Knox Utility District, Route #20, Knoxville, Tennessee 37921
Davis, John M.	Lawyer-City of Wartburg, Wartburg, Tenn. Box 8 37887
Deem, Richard R.	Staff Consultant, The Mead Corporation, Central Research, Chillicothe, Ohio 45601
Dings, Dr. P. M.	Director, Anderson County Health Department, Clinton, Tennessee 37716
Dodge, John B.	Tri-County Sportsman Club, Oliver Springs, Tennessee 37840
DuBois, C. M.	Smoky Mountains Hiking Club, Route #3, Box 64
Dunn, Lamar	Sanitary Engineer, Tennessee Department of Public Health, 617 Cumberland Avenue, State Office Building,
Dunsmore, Roy G.	Lincoln Memorial University, P. O. Box 104, Harrogate, Tennessee 37752
Dykstra, J.	Union Carbide-Nuclear, Oak Ridge, Tenn.
Edwards, W. M.	Engineer, Atomic Energy Commission, Oak Ridge, Tennessee
Ellison, James H.	Tennessee State Planning Commission, Box 1069, Knoxville, Tennessee 37901
Enloe, Joseph S.	Engineer, TVA, Box 676, Waynesville, North Carolina 28786
Etnier, David A.	Department of Zoology, University of Tennessee, Knoxville, Tennessee
Foster, R. J.	Carborundum Company, Box 423, Building 66, Niagara Falls, New York.
Francke, H. C.	Councilman, 201 Manhattan, Oak Ridge, Tenn. 378

Attendance List - Page 3

Freytag, Floyd E.	Sessions Judge, Plateau Utility District, Wartburg, Tennessee
Galyran, Taylor	Avondale Farms , Box 24, Knoxville, Tennessee
Gent, Jimmy, Mayor	Town of Jacksboro, Box 74, Jacksboro, Tenn. 377
Gill, Allan	Manager, Hallsdale Powell Utility District, 3745 Cunningham Drive, Knoxville, Tenn.
Gryder, Reid	East Tennessee White Water Club, P. O. Box 3074 Oak Ridge, Tennessee 37830
Hall, Roy T.	Cumberland County Chamber of Commerce, P. O. Box 453, Crossville, Tennessee 38555
Hammock, Lon C.	President, L. C. Hammock Company, 398 North Main Street, Clinton, Tennessee 37716
Harness, Janie	Laurel Grove Committee, Route #2, Oliver Springs, Tennessee 37840
Hartman, W. C.	Union Carbide-Nuclear, P. O. Box P, Oak Ridge, Tennessee
Hempson, D. A.	Water Services, Inc., P. O. Box 10126, Knoxville Tennessee
Henniss, J. L.	Chairman, Clinton Utilities Board, 409 Central Avenue, Clinton, Tennessee 37716
Henry, Ray	Supervisor, Game and Fish Commission, Route #4, Harriman, Tennessee 37748
Hibbitts, H. W.	Safety and Environmental Control Division, Box E, Oak Ridge, Tennessee
Hill, Don	TVA, Fisheries Lab, Norris, Tennessee 37828
Holladay, Frank	Quality Control-Plant Chemist, The Carter's Ink Company, West Avenue, No., Crossville, Tennessee 38555
Hook, M. L.	Division Manager, The Mead Corporation, Harriman, Tennessee 37748
Hopkins, H. P.	Chief of Planning and Development, Tennessee Department of Public Health, 103 Capital Towers Nashville, Tennessee 37219

Attendance List - Page 4

Jacobson, Warren

Production Manager, Carter's Ink Company,
Crossville, Tennessee 38555

Jared, Donald

Environmental Action Council of Oak Ridge,
107 Fulton Lane, Oak Ridge, Tenn. 37832

Jordan, Robert G.

Union Carbide Corporation, P. O. Box P
Oak Ridge, Tennessee

Judkins, Stewart

The Knoxville Journal, Knoxville, Tennessee

Krause, Carolyn

Reporter, The Oak Ridger, Tyrone Road,
Oak Ridge, Tennessee 37830

LaFon, John W.

Environmental Protection Agency, Water Quality
Office, 416 Edney Building, Chattanooga, Tenn.

Land, Robert T., Jr.

Game and Fish Commission, 112 Paris Lane,
Oak Ridge, Tennessee

Lenhard, Joseph A.

Safety Director, U.S. Atomic Energy Commission,
P. O. Box E, Oak Ridge, Tennessee

Magill, Joe E.

County Judge, Anderson County, Clinton, Tenn.
37716

Manning, Robert

Anderson County Health Department, Broad Street
Clinton, Tennessee 37716

McElroy, Thomas H.

Tennessee Asphalt Company, P. O. Box 413,
Knoxville, Tennessee

McMullin, Carleton

City Manager, P. O. Box 1, Oak Ridge, Tenn.

Napier, Taylor D.

Maintenance Supervisor, Carborundum Company,
P. O. Box 67, Jacksboro, Tennessee

Nelson, Daniel J.

Oak Ridge National Laboratory, Ecological
Sciences Division, Oak Ridge, Tennessee 37830

Oaks, James

Supervisor, Hawkins County Board of Education,
Rogersville, Tennessee 37857

Parks, Mrs. Hobart

Laurel Grove, Route #1, Briceville, Tenn. 37710

Pace, Paris

President, North Anderson Utility District,
Lake City, Tennessee 37769

Parks, Paul W.

Superintendent, Lake City Water Department,
Lake City, Tennessee 37769

Attendance List - Page 5

Pemberton, James P.

Engineer, Barge, Waggoner & Sumner Engineers,
Bank of Commerce, Morristown, Tenn. 37813

Pinkerton, James W.

Tennessee Division of Water Resources, Room 51,
Evans Building, 524 Union Avenue, Knoxville,
Tennessee 37902

Ramke, Thomas F.

Area Representative, TVA, 118 Evans Building
Knoxville, Tennessee

Rowe, Harry B.

Director, Clinch-Powell River Association,
Box 85, New Tazwell, Tenn. 37825

Richardson, Troy

Route #1, Clinton, Tennessee 37716

Ross, E. H.

Manager, Clinton Utilities Board, Clinton,
Tennessee 37716

Russell, Mrs. Liane B.

Tennessee Citizens for Wilderness Planning,
130 Tabor Road, Oak Ridge, Tenn. 37830

Russell, Thomas H.

Hawkins County Board of Education, Rogersville,
Tennessee 37857

Schultz, Neil B.

Head-Safety, Health Physics, Industrial Hygiene
UCND-ORGRP, P. O. Box P, Oak Ridge, Tennessee
37830

Seawell, Bill

Game and Fish Commission, 618 Church Avenue, S.
Knoxville, Tennessee 37902

Seigworth, Kenneth J.

Conservation Consultant, Norris, Tenn. 37828

Shelton, A. P.

Southern Railway, 101 Gayst, S.W., Knoxville,
Tennessee 37901

Sherry, Dan

Game and Fish Commission, Box 9400, Nashville,
Tennessee 37204

Smith, Ralph R.

Couthouse, Clinton, Tennessee 37716

Smith, Wade W.

Wayne L. Smith & Associates, Inc., 2800 Merchant
Road, Knoxville, Tenn. 37912

Smith, Wayne L.

Wayne L. Smith & Associates, Inc., 2800 Merchant
Road, Knoxville, Tenn. 37912

Speas, Irvin G.

Union Carbide Corporation-Nuclear Division,
Y-12 Plant, Building 9733-2, Oak Ridge, 37830

Steiner, Gerald R.

TVA, Water Quality Branch, 416 Edney Building,
Chattanooga, Tenn. 37402

Attendance List - Page 6

Sulfridge, Wade	Superintendent of Buildings and Grounds, Lincoln Memorial University, Harrogate, Tennessee 37752
Tatum, Reid	Game and Fish Commission, Box D, Carroll Reese Station, Johnson City, Tenn. 37601
Thach, William P., Jr.	Vice President, L. C. Hammock Company, 398 North Main Street, Clinton, Tenn. 37716
Trentham, Terry	Southern Railway, 2236 Western Avenue, Knoxville Tennessee 37921
Tucker, Hearly W.	District Conservationist, Soil Conservation Service, P. O. Box 252, Clinton, Tenn. 37716
Wallace, Franklin D.	Vice Mayor, Jacksboro, Tennessee 37757
Wilson, Luther C.	Manager, North Anderson County Utility District R-2, Lake City, Tennessee 37769
Wing, Jerome F.	Chief, Waste Management & Pollution Control Board, U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tennessee 37830
Wood, Donald C.	Attorney, Union Carbide, P. O. Box Y, Oak Ridge Tennessee
Wyatt, Fred W.	Area Supervisor, Division Strip-Mining, 618 West Church Street, Knoxville, Tenn.

STREAM STANDARDS

The following two documents, the "Stream Classification" chart and "General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee" constitute the proposed stream standards for the area described.

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Clinch River	Mouth at Tennessee River (mile 567.8) to mile 4.4 (Emory River)	X	X	X	X	X	X	X
Emory River	Mouth to headwaters	X	X	X	X	X	X	
Little Emory River	Mouth at Emory River (mile 5.2) to headwaters	X	X	X	X	X	X	
Mid Fork Little Emory R.	Mouth at Little Emory River (mile 9.6) to headwaters			X	X	X	X	
Davis Branch	Mouth at Mid Fk. Little Emory R. (mile 1.8) to mile 0.2.			X		X	X	
Unnamed Tributary	Mouth at Emory River (mile 16.4) to Oakdale School STP (mile 1.0)			X		X	X	
Crooked Fork Creek	Mouth at Emory River (mile 23.8) to mile 4.9			X	X	X	X	
Unnamed Tributary	Mouth at Crooked Fork Creek (mile 4.9) to headwaters			X		X	X	
Crooked Fork Creek	Mile 4.9 to mile 6.7			X	X	X	X	
Flat Fork	Mouth at Crooked Fork Creek (mile 6.7) to headwaters			X		X	X	
Unnamed Tributary	Mouth at Flat Fork (mile 2.3) to headwaters			X	X	X	X	

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and	Wildlife	Navigation
Crooked Fork	Mile 6.7 to headwaters			X	X	X	X		
Stockstill Creek	Mouth at Crooked Fork (mile 18.7) to mile 0.4			X		X	X		
Stockstill Creek	Mile 0.4 to headwaters			X	X	X	X		
Obed River	Mouth at Emory River (mile 28.4) to mile 9.0			X	X	X	X		
Daddy's Creek	Mouth at Obed River (mile 9.1) to headwaters			X	X	X	X		
Basses Creek	Mouth at Daddy's Creek (mile 34.9) to mile 6.0			X	X	X	X		
Basses Creek	Mile 6.0 to mile 6.2			X		X	X		
Basses Creek	Mile 6.2 to headwaters			X	X	X	X		
Obed River	Mile 9.1 to mile 23.4			X	X	X	X		
Fox Creek	Mouth at Obed River (mile 23.4) to headwaters			X	X	X	X		
Scantling Branch	Mouth at Fox Creek (mile 2.7) to mile 1.0			X	X	X	X		
Scantling Branch	Mile 1.0 to mile 1.2			X		X	X		
Unnamed Tributary	Mouth at Scantling Branch (mile 1.2) to headwaters			X		X	X		
Scantling Branch	Mile 1.2 to headwaters			X	X	X	X		
Obed River	Mile 23.4 to mile 34.6			X	X	X	X		

PROPOSED STREAM USE CLASSIFICATION

<u>Stream</u>	<u>Description</u>	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Unnamed Tributary	Mouth at Obed River (mile 34.6) to mile 0.2			X		X	X	
Unnamed Tributary	Mile 0.2 to headwater			X	X	X	X	
Obed River	Mile 34.6 to mile 38.6			X(1)		X	X	
Obed River	Mile 38.6 to mile 40.1			X	X	X	X	
Obed River	Mile 40.1 to headwaters	X	X	X	X	X	X	
Unnamed Tributary	Mouth at Obed River 45.4 to headwaters			X	X	X	X	
Clinch River	Mile 4.4 to mile 12.0 (Poplar Creek)	X	X	X	X	X	X	X
Poplar Creek	Mouth at Clinch River (mile 12.0) to mile 0.5		X					
Poplar Creek	Mile 0.5 to 1.3			X	X	X	X	
Poplar Creek	Mile 1.3 to mile 5.5			X		X	X	
E. Fork Poplar Creek	Mouth at Poplar Creek (mile 5.5) to mile 1.3			X	X	X	X	
Bear Creek	Mouth at E. Fork Poplar Creek (mile 1.3) to headwaters			X	X	X	X	
E. Fork Poplar Creek	Mile 1.3 to mile 4.8			X	X	X	X	
E. Fork Poplar Creek	Mile 4.3 to mile 8.3			X(1)		X	X	
E. Fork Poplar Creek	Mile 8.3 to dam at AEC 4-12			X	X	X	X	

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock and Watering	Wildlife	Navigation
Poplar Creek	Mile 5.5 to mile 12.4			X	X	X	X		
Poplar Creek	Mile 12.4 to mile 14.3			X(1)		X	X		
Indian Creek	Mouth at Poplar Creek (mile 14.3) to headwaters			X	X	X	X		
Poplar Creek	Mile 14.3 to mile 14.4			X(1)		X	X		
Poplar Creek	Mile 14.4 to headwaters			X	X	X	X		
Clinch River	Mile 12.0 to mile 20.8	X	X	X	X	X	X		X
White Oak Creek	Mouth at Clinch River (mile 20.8) to mile 1.5			X			X		
Melton Branch	Mouth at White Oak Creek (mile 1.5) to headwaters			X			X		
White Oak Creek	Mile 1.5 to headwaters			X			X		
Clinch River	Mile 20.8 to mile 39.6	X	X	X	X	X	X		X
Beaver Creek	Mouth at Clinch River (mile 39.6) to mile 8.4	X	X	X	X	X	X		
Beaver Creek	Mile 8.4 to mile 10.4			X		X	X		
Beaver Creek	Mile 10.4 to mile 17.5	X	X	X	X	X	X		
Beaver Creek	Mile 17.5 to mile 17.9			X			X		
Beaver Creek	Mile 17.9 to mile 21.6	X	X	X	X	X	X		
Beaver Creek	Mile 21.6 to mile 23.6			X(1)		X	X		

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Beaver Creek	Mile 23.6 to mile 29.4	X	X	X	X	X	X	
Beaver Creek	Mile 29.4 to mile 31.4			X(1)		X	X	
Beaver Creek	Mile 31.4 to headwaters	X	X	X	X	X	X	
Unnamed Tributary	Mouth at Beaver Creek (mile 44.1) to mile 0.5			X		X	X	
Unnamed Tributary	Mile 0.5 to headwaters			X	X	X	X	
Clinch River	Mile 39.6 to mile 41.1	X	X	X	X	X	X	X
Scarboro Creek	Mouth at Clinch River (mile 41.1) to mile 1.0			X	X	X	X	
Scarboro Creek	Mile 10. to mile 1.3			X		X	X	
Scarboro Creek	Mile 1.3 to headwaters			X	X	X	X	
Clinch River	Mile 41.1 to mile 46.7	X	X	X	X	X	X	X
Bull Run Creek	Former mouth at Clinch River (mile 46.7) to mile 4.9			X	X	X	X	
Nelson Branch	Mouth at Bull Run Creek (mile 4.9) to mile 4.8			X	X	X	X	
Nelson Branch	Mile 4.8 to mile 5.0			X		X	X	69
Blaze Branch	Mouth at Nelson Branch (mile 5.0) to mile 0.4			X		X	X	
Blaze Branch	Mile 0.4 to headwaters			X	X	X	X	

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Nelson Branch	Mile 5.0 to headwaters			X	X	X	X	
Bull Run Creek	Mile 4.9 to headwaters			X	X	X	X	
Clinch River	Mile 46.7 to mile 47.8	X	X	X	X	X	X	X
Worthington Branch	Former mouth at Clinch River (mile 47.8) to mile 3.4			X		X	X	
Worthington Branch	Mile 3.4 to headwaters			X	X	X	X	
Clinch River	Mile 47.8 to mile 50.7	X	X	X	X	X	X	X
Braden Branch	Former mouth at Clinch River (mile 50.7) to mile 1.7			X	Radioactive Restricted	X	X	
Braden Branch	Mile 1.7 to headwaters			X	X	X	X	
Clinch River	Mile 50.7 to mile 51.1	X	X	X	X	X	X	X
Unnamed Tributary	Mouth at Clinch River (mile 51.1) to mile 0.5			X(1)		X	X	
Unnamed Tributary	Mile 0.5 to headwaters			X	X	X	X	
Clinch River	Mile 51.1 to mile 61.5	X	X	X	X	X	X	X ⁶⁷
Clinch River *	Mile 61.5 to mile 202.1 (Virginia-Tenn. Line)	X	X	X	X	X	X	

*Change from 1967 classification

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Hinds Creek	Mouth at Clinch River (mile 65.) to mile 5.5			X	X	X	X	
Buffalo Creek	Mouth at Hinds Creek (mile 5.5) to mile 2.6			X	X	X	X	
Buffalo Creek	Mile 2.6 to mile 3.6			X(1)		X	X	
Buffalo Creek	Mile 3.6 to headwaters			X	X	X	X	
Hinds Creek	Mile 5.5 to headwaters			X	X	X	X	
Cane Creek	Mouth at Clinch River (mile 71.3) to mile 1.9			X	X	X	X	
Blowing Spring Fork	Mouth at Cane Creek (mile 1.9) to mile 2.0			X	X	X	X	
Blowing Spring Fork	Mile 2.0 to mile 2.3			X		X	X	
Blowing Spring Fork	Mile 2.3 to headwaters			X	X	X	X	
Cane Creek	Mile 2.0 to headwaters			X	X	X	X	
Coal Creek	Mouth at Clinch River (mile 75.0) to mile 1.e			X	X	X	X	
Coal Creek	Mile 1.3 to mile 3.3			X(1)		X	X	
Coal Creek	Mile 3.3 to mile 8.4			X	X	X	X	
Coal Creek	Mile 8.4 to mile 8.6			X		X	X	
Unnamed Tributary	Mouth at Coal Creek (mile 8.6) to mile 0.1			X		X	X	
Unnamed Tributary	Mile 0.1 to headwaters			X	X	X	X	

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Powell River*	Former mouth at Clinch River (mile 88.8) to mile 115.7 (Virginia-Tenn. Line)	X	X	X	X	X	X	
Gap Creek	Mouth at Powell River (mile 57.7) to mile 8.0			X	X	X	X	
Gap Creek	Mile 8.0 to mile 9.2			X		X	X	
Gap Creek	Mile 9.2 to headwaters			X	X	X	X	
Unnamed Spring Branch	From Sinkhole to Lincoln Memorial University STP			X(1)		X	X	
Unnamed Spring Branch	From STP to headwaters			X		X	X	
Russell Creek	Mouth at Powell River (mile 82.4) to mile 2.8			X	X	X	X	
Russell Creek	Mile 2.8 to mile 6.0			X(1)		X	X	
Russell Creek	Mile 6.0 to headwaters			X	X	X	X	
Mill Creek	Former mouth at Clinch River (mile 98.0 to headwaters			X	X	X	X	
Byram's Creek	Former mouth at Mill Creek (mile 0.5 to headwaters			X	X	X	X	

*Mile point change from 1967 classification

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
Unnamed Tributary	Former mouth at Byram's Creek (mile 2.3) to mile 0.2			X		X	X	
Unnamed Tributary	Mile 0.2 to headwaters			X	X	X	X	
Poor Land Creek	Former mouth at Clinch River (mile 104.2) to headwaters			X	X	X	X	
Dry Tributary	From mouth at Poor Land Creek (mile 2.5) to wastewater discharge							X
Hunting Creek	Former mouth at Clinch River (mile 118.3) to headwaters			X	X	X	X	
Unnamed Tributary	Former mouth at Hunting Creek (mile 2.0) to mile 0.3			X		X	X	
Unnamed Tributary	Mile 0.3 to headwaters			X	X	X	X	
Big War Branch	Mouth at Clinch River (mile 164.4) to headwaters			X	X	X	X	
Flat Gap Creek	Mouth at Big War Branch (mile 7.0) to mile 2.8			X	X	X	X	
Flat Gap Creek	Mile 2.8 to mile 3.0			X		X	X	
Flat Gap Creek	Mile 3.0 to headwaters			X	X	X	X	

PROPOSED STREAM USE CLASSIFICATION

Stream	Description	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
North Fork Clinch River*	River mouth at Clinch River (mile 192.0) to mile 2.2 (Virginia-Tenn. Line)	X	X	X	X	X	X	
All other tributaries not specifically noted shall be classified								
				X	X	X	X	X

(1) Ref., General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee; Criteria of Water Conditions, Section 3a. "Treated effluent discharged, a minimum of 3.0 mg/L dissolved oxygen shall be allowed."

*Change in mile point from 1967 classification

PROPOSED STREAM USE CLASSIFICATION
(TROUT STREAMS)

In accordance with General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee, Criteria of Water Conditions, Section 3a. "A minimum dissolved oxygen content of 6 milligrams per liter shall be maintained in recognized trout streams." The stream segments that are considered trout waters are as follows:

<u>Stream</u>	<u>County Location</u>	<u>Stream mileage</u>
Clinch River Basin		
White Creek	W. Union	Mouth to mile 2.0
Clinch River	N. Anderson	Hwy. 61, mile 66.2 to Norris Dam, mile 79.8
Bacon Springs Creek	Anderson	Mouth to mile 2.0
Clear Creek	W. Union	Mouth to mile 2.0
Big War Creek	S. Hancock & W. Hawkins	Mile 8 to origin
Ball Creek	S. Claiborne	Mouth to origin

GENERAL WATER QUALITY CRITERIA FOR THE DEFINITION AND CONTROL OF

POLLUTION IN THE WATERS OF TENNESSEE

Adopted on May 26, 1967

Amended on Nov. 17, 1967 and May 22, 1970

Tennessee Stream Pollution Control Board

Tennessee Code Annotated, Sections 70-301 through 70-319, makes it the duty of the Stream Pollution Control Board to study and investigate all problems concerned with the pollution of the waters of the State and with its prevention, abatement, and control and to establish such standards of quality for any waters of the State in relation to their reasonable and necessary use as the Board shall deem to be in the public interest and establish general policies relating to existing or proposed future pollution as the Board shall deem necessary to accomplish the purpose of the Control Code. The following general considerations and criteria are officially adopted by the Board as a guide in determining the permissible conditions of waters with respect to pollution and the preventive or corrective measures required to control pollution in various waters or in different sections of the same waters.

GENERAL CONSIDERATIONS

1. Waters have many uses which in the public interest are reasonable and necessary. Such uses include: sources of water supply for domestic and industrial purposes; propagation and maintenance of fish and other desirable aquatic life; recreational boating and fishing; the final disposal of municipal sewage and industrial waste following adequate treatment; stock watering and irrigation; navigation; generation of power; and the enjoyment of scenic and esthetic qualities of the waters.
2. The rigid application of uniform water quality is not desirable or reasonable because of the varying uses of such waters. The assimilative capacity of a stream for sewage and waste varies depending upon various factors including the following: volume of flow, depth of channel, the presence of falls or rapids, rate of flow, temperature, natural characteristics, and the nature of the stream. Also the relative importance assigned to each use will differ for different waters and sections of waters throughout the stream.
3. To permit reasonable and necessary uses of the waters of the State, existing pollution should be corrected as rapidly as practical and future pollution controlled by treatment plants or other measures. There is an economical balance between the cost of sewage and waste treatment and the benefits received and within permissible limits the dilution factor and the assimilative capacity of surface water should be utilized. Waste recovery, control of rates and dispersion of waste into the streams, and control of rates and characteristics of flow of waters in the stream where adequate, will be considered to be a means of correction.
4. Sewage, industrial wastes, or other wastes, as defined in the Stream Pollution Control Code, shall not be discharged into or adjacent to streams or other surface waters in such quantity and of such character or under such conditions of discharge in relation to the receiving waters as will result in visual or olfactory nuisances, undue interference to other reasonable and necessary uses of the water, or appreciable damage to the natural processes of self-purification. In relation to the various qualities and the specific uses of the receiving waters, no sewage, industrial wastes, or other wastes discharged shall be responsible for conditions

that fail to meet the criteria of water quality outlined below. Bypassing or accidental spills will not be tolerated.

The criteria of water quality outlined below are considered as guides in applying the water quality objectives in order to insure reasonable and necessary uses of the waters of the State. In order to protect the public health and maintain the water suitable for other reasonable and necessary uses; to provide for future development; to allow proper sharing of available water resources; and to meet the needs of particular situations additional criteria will be set.

CRITERIA OF WATER CONDITIONS

1. Domestic Raw Water Supply

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - There shall be no substances added to the waters that will increase the hardness or mineral content of the waters to such an extent to appreciably impair the usefulness of the water as a source of domestic water supply.
- (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
- (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily sleek, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of domestic water supply.
- (f) Turbidity or Color - There shall be no turbidity or color added in amounts or characteristics that can not be reduced to acceptable concentrations by conventional water treatment processes.
- (g) Temperature - The temperature of the water shall not exceed 93°F. and the maximum rate of change shall not exceed 3° F. per hour. In no case shall the maximum temperature rise be more than 10° F. above the stream temperature which shall be measured at an upstream control point.
- (h) Microbiological Coliform - Coliform group shall not exceed 10,000 per 100 ml. as a monthly average value (either MPN or MF count); nor exceed this number in more than 20 per cent of the samples examined during any month; nor exceed 20,000 per 100 ml. in more than five per cent of such samples. These values may be exceeded provided the organisms are known to be of nonfecal origin. No disease producing bacteria or other objectionable organisms shall be added to surface waters which will result in the contamination of said waters to such an extent as to render the water unsuitable as sources of domestic water supply after conventional water treatment.

- (i) Taste or Odor - There shall be no substances added which will result in taste or odor that prevent the production of potable water by conventional water treatment processes.
- (j) Toxic Substances - There shall be no toxic substances added to the waters that will produce toxic conditions that materially affect man or animals or impair the safety of a conventionally treated water supply.
- (k) Other Pollutants - Other pollutants shall not be added to the water in quantities that may be detrimental to public health or impair the usefulness of the water as a source of domestic water supply.

2. Industrial Water Supply.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - There shall no no substances added to the waters that will increase the hardness of mineral content of the waters to such an extent as to appreciably impair the usefulness of the water as a source of industrial water supply.
- (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
- (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily sleek, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of industrial water supply.
- (f) Turbidity or Color - There shall be no turbidity or color added in amounts or characteristics that can not be reduced to acceptable concentrations by conventional water treatment processes.
- (g) Temperature - The temperature of the water shall not exceed 93° F. and the maximum rate of change shall not exceed 3° F. per hour. In no case shall the maximum temperature rise be more than 10° F. above the stream temperature which shall be measured at an upstream control point.
- (h) Taste or Odor - There shall be no substances added that will result in taste or odor that would prevent the use of the water for industrial processing.
- (i) Toxic Substances - There shall be no substances added to the waters that may produce toxic conditions that will adversely affect the water for industrial processing.
- (j) Other Pollutants - Other pollutants shall not be added to the waters in quantities that may adversely affect the water for industrial processing.

3. Fish and Aquatic Life

- (a) Dissolved Oxygen - The dissolved oxygen shall be maintained at 5.0 mg/l except in limited sections of the stream receiving treated effluents. In these limited sections, a minimum of 3.0 mg/l dissolved oxygen shall be allowed. The dissolved oxygen content shall be measured at mid-depth in waters having a total depth of ten (10) feet or less and at a depth of five (5) feet in waters having a total depth of greater than ten (10) feet. A minimum dissolved oxygen content of 6.0 mg/l shall be maintained in recognized trout streams.
- (b) pH - The pH value shall lie within the range of 6.5 to 8.5 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.
- (d) Turbidity or Color - There shall be no turbidity or color added in such amounts or of such character that will materially affect fish and aquatic life.
- (e) Temperature - The temperature of the water shall not exceed 93° F. and the maximum rate of change shall not exceed 3° F. per hour. The maximum temperature of recognized trout streams shall not exceed 68° F. In no case shall the maximum temperature rise be more than 10° F. above the stream temperature which shall be measured at an upstream control point.
- (f) Taste or Odor - There shall be no substances added that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life.
- (g) Toxic Substances - There shall be no substances added to the waters that will produce toxic conditions that affect fish or aquatic life.
- (h) Other Pollutants - Other pollutants shall not be added to the waters that will be detrimental to fish or aquatic life.

4. Recreation

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Solids, Floating Materials, and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to recreation.

- (d) Turbidity or Color - There shall be no turbidity or color added in such amounts or character that will result in an objectionable appearance to the water.
- (e) Temperature - The temperature of the water shall not exceed 93° F. and the maximum rate of change shall not exceed 3° F. per hour. In no case shall the maximum temperature rise be more than 10° F. above the stream temperature which shall be measured at an upstream control point.
- (f) Microbiological Coliform - The fecal coliform group shall not exceed 5,000 per 100 ml. as a monthly average value nor exceed this number in more than 20 per cent of the samples examined during any month nor exceed 20,000 per 100 ml. in more than five per cent of such samples. In those waters that are physically suitable and available to the public for water-contact recreation the fecal coliform concentration shall not exceed 1,000 per 100 ml. in any two consecutive samples collected during the months of May through September. Water areas near outfalls of domestic sewage treatment plants are not considered suitable for water-contact recreation.
- (g) Taste or Odor - There shall be no substances added that will result in objectionable taste or odor.
- (h) Toxic Substances - There shall be no substances added to the water that will produce toxic conditions that affect man or animal.
- (i) Other Pollutants - Other pollutants shall not be added to the water in quantities which may have a detrimental effect on recreation.

5. Irrigation

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - There shall be no substances added to the water that will increase the mineral content to such an extent as to impair its use for irrigation.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily sleek, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water for irrigation purposes.
- (e) Temperature - The temperature of the water shall not be raised or lowered to such an extent as to interfere with its use for irrigation purposes.
- (f) Toxic Substances - There shall be no substances added to water that will produce toxic conditions that will affect the water for irrigation.

- (g) Other Pollutants - Other pollutants shall not be added to the water in quantities which may be detrimental to the waters used for irrigation.

6. Livestock Watering and Wildlife

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - There shall be no substances added to water that will increase the mineral content to such an extent as to impair its use for livestock watering and wildlife.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily sleek, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with livestock watering and wildlife.
- (e) Temperature - The temperature of the water shall not be raised or lowered to such an extent as to interfere with its use for livestock watering and wildlife.
- (f) Toxic Substances - There shall be no substances added to water that will produce toxic conditions that will affect the water for livestock watering and wildlife.
- (g) Other Pollutants - Other pollutants shall not be added to the water in quantities which may be detrimental to the water for livestock watering and wildlife.

7. Navigation

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) Hardness or Mineral Compounds - There shall be no substances added to the water that will increase the mineral content to such an extent as to impair its use for navigation.
- (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily sleek, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with navigation.
- (d) Temperature - The temperature of the water shall not be raised or lowered to such an extent as to interfere with its use for navigation purposes.

- (e) Toxic Substances - There shall be no substances added to water that will produce toxic conditions that will affect the water for navigation.
- (f) Other Pollutants - Other pollutants shall not be added to the water in quantities which may be detrimental to the waters used for navigation.

These criteria should not be construed as permitting the degradation of higher quality water when such can be prevented by reasonable pollution control measures. The above conditions are recognized as applying to waters affected by the discharge of sewage and/or industrial waste or other waste and not resulting from natural causes.

DEFINITIONS

1. Conventional Water Treatment - Conventional water treatment as referred to in the criteria denotes coagulation, sedimentation, filtration and chlorination.
2. Mixing Zone - Mixing zone refers to that section of flowing stream or impounded waters necessary for effluents to become dispersed.

The mixing zone necessary in each particular case shall be defined by the Tennessee Stream Pollution Control Board.

INTERPRETATION OF CRITERIA

1. Interpretations of the above criteria shall conform to any rules and regulations or policies adopted by the Stream Pollution Control Board.
2. Insofar as practicable, the effect of treated sewage or waste discharges on the receiving waters shall be considered after they are mixed with the waters and beyond a reasonable zone of immediate effect upon the qualities of the waters. The extent to which this is practicable depends upon local conditions and the proximity and nature of other uses of the waters.
3. The technical and exonomical feasibility of waste treatment, recovery, or adjustment of the method of discharge to provide correction shall be considered in determining the time to be allowed for the development of practicable methods and for the specified correction.
4. The criteria set forth shall be applied on the basis of the following stream flows: unregulated streams - stream flows equal to or exceeding the 3-day minimum, 20-year recurrence interval; regulated streams - instantaneous minimum flow.
5. In general, deviations from normal water conditions may be undesirable, but the rate and extent of the deviations should be considered in interpreting the above criteria.
6. The criteria and standards provide that all discharges of sewage, industrial waste, and other wastes will receive the best practicable treatment (secondary or the equivalent) or control according to the policy and procedure of the Tennessee Stream Pollution Control Board. A degree of treatment greater than secondary when necessary to protect the water uses will be required for selected sewage and waste discharges.

TENNESSEE ANTIDEGRADATION STATEMENT

1. The Standards and Plan adopted are designed to provide for the protection of existing water quality and/or the upgrading or "enhancement" of water quality in every interstate stream within Tennessee. It is recognized that some waters may have existing quality better than established standards.
2. The Criteria and Standards shall not be construed as permitting the degradation of these higher quality waters when such can be prevented by reasonable pollution control measures. In this regard, existing high quality water will be maintained unless and until it is affirmatively demonstrated to the Tennessee Stream Pollution Control Board that a change is justifiable as a result of necessary social and economic development.
3. All discharges of sewage, industrial waste, or other waste shall receive the best practicable treatment (secondary or the equivalent) or control according to the policy and procedure of the Tennessee Stream Pollution Control Board. A degree of treatment greater than secondary when necessary to protect the water uses will be required for selected sewage and waste discharges.
4. In implementing the provisions of the above as they relate to interstate streams, the Tennessee Stream Pollution Control Board will cooperate with the Secretary of the Interior in order to assist him in carrying out his responsibilities under the Federal Water Pollution Control Act, as amended.

March 8, 1971